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ORIGINAL COMMUNICATIONS.

THE INFECTIVITY OF MALIGNANT GROWTHS.[1]

By G. Bellingham Smith, M.B., B.S., F.R.C.S., *Obstetric Registrar and Tutor to Guy's Hospital, etc.;* and J. W. Washbourn, M.D., F.R.C.P., *Physician to Guy's Hospital; Physician to the London Fever Hospital, etc.*

Theories regarding the etiology of new growths.—In discussing the infectivity of malignant growths, we shall first consider very shortly some of the theories that have been brought forward to explain the causation of new growths. Such theories as that which ascribes tumours to some influence exerted by the nervous system, or that which regards tumours as idiopathic in origin, we may dismiss at once. The theories which regard the influence exerted by heredity, or which look upon a certain dyscrasia or fitness of soil as sufficient to explain the phenomena of new growths, need not detain us. That they are factors of importance in regard to predisposition, there can be no doubt; but as they are not capable of explaining either why a growth should make its appearance, or the phenomena of malignancy, we shall not discuss them any further.

The *embryonal theory* of Cohnheim undoubtedly offers a satisfactory explanation of some tumours. According to this view, new growths originate in persistent remnants of embryonic tissue that have not been used up in the course of development. And the possibility of tumours developing from these remnants is explained by the inherent power of growth possessed by embryonic tissue. As examples of tumours the origin of which can be satisfactorily explained by this theory, we may mention the enchondromata of bone and the congenital sacro-coccygeal tumours. This theory further receives some confirmation from the results obtained by transplantation of fœtal structures to adult tissues. Such grafts have been shown to be capable of a certain amount of growth, though always to a limited extent.[1] But as a satisfactory explanation of the etiology and phenomena of all growths, more especially the malignant growths, and their infective characteristics, Cohnheim's theory fails.

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[1] Read before the Medical Society of London.

The next theory we shall consider is the *inflammatory or irritation theory.* The lines of distinction between inflammatory hyperplasias and new growths are by no means sharply defined, more especially as regards tumours of the connective tissue type. Shattock has put on record the case of a large fibroma occurring in the pelvis, which contained in its centre a piece of steel, which was evidently the essential cause of its formation. The influence of chronic inflammatory and irritative conditions on epithelium is well known. In tuberculous disease of the tongue, for instance, the overgrowth is occasionally so well marked that it has been taken under the microscope for epithelioma; and in chronic ulcers of the leg the epithelial proliferation is so pronounced that Formad some years ago considered that a large number of these ulcers were to be regarded as epitheliomatous. Malignant growths so frequently follow chronic inflammations and irritations, that we can readily understand how widely accepted is this theory of the causation of growths; and of its importance as a factor in their etiology perhaps too much stress cannot be laid, from a clinical point of view.

But whilst admitting these facts, and recognising that local irritation may give rise to local overgrowths, we are far from explaining the infective properties possessed by these local growths. To explain these, we have to fall back on the theory that as the result of the epithelial proliferation certain cells get detached from their normal connections, and either as the result of inherent powers of indefinite multiplication, or from certain acquired powers, they are capable of giving rise to both local and distant deposits. This theory is practically a modification of that of Thiersch.

According to the views of this author, the explanation of carcinoma in later life is to be looked for rather in an alteration of the mutual relationships between the different tissues, than in any increased activity on the part of the cells; that, in fact, there exists a natural antagonism between the epithelium and its surrounding connective tissue. In old age the connective tissue becomes looser in texture and its resistance lowered, and the epithelial cells proliferating, perhaps as the result of some local irritation, readily penetrate into the enlarged spaces and lymphatics. Here, in accordance with their life history, they continue to grow indefinitely.

According to this view, then, the epithelial cell detached from its normal connections may on occasion preserve all its original characters of continuous growth; and to this power of indefinite multiplication the phenomena of malignancy are ascribed. With, however, the exception of an experiment by Dr. Lambert Lack, we have no evidence, experimental or otherwise, to support this view. Transplanted tissues have never been shown to possess any power of indefinite growth. The skin graft having served the purpose for which it was intended, ceases growing. Its capacity for growth is limited by the necessities of the case. The nearest approach, perhaps, to new growths, resulting from epithelial transplantation, is seen in the implantation cysts, when a small portion of epithelium carried deep into the tissue beneath gives rise to a dermoid.

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[1] On this subject we would refer to a recent paper by Birch-Hirschfeld and Garten in *Beitr. z. path. Anat. u. z. allg. Path.*, Jena, Bd. xxvi. Heft 1.

Lack's experiment may have a very important bearing, if not on the etiology of malignant tumours, at all events on their secondary infective characters. He opened the peritoneal cavity of a rabbit, and, having cut open an ovary, scraped the surface with a knife, allowing the milky juice thus obtained to diffuse through the peritoneal cavity. The rabbit remained well for nearly a year. It then became weaker, and suffered from dyspnœa, and two months later was killed. On post-mortem examination, masses of new growth were found scattered through the peritoneal cavity, pericardium, liver, and uterus. These masses on section showed the structure of a columnar-celled carcinoma.

This experiment must necessarily be repeated, before the conditions found can be accepted as due to the operation performed. If we regard the experiment as it stands as satisfactory, we are led to the conclusion that a healthy epithelial cell, when detached from its normal connections and grafted elsewhere, is capable of indefinite multiplication, and of giving rise to a tumour which in its structure and behaviour presents all the characteristics of malignancy. And this takes us even further than Thiersch's view, for the latter presupposes some alteration in the relationships, owing to advancing age, between the epithelial and connective tissue structures.

With all our existing knowledge as regards transplantation of fœtal and adult tissues, this experiment is difficult to accept, but a still greater difficulty is met with when we try to explain some of the other features of malignant growths. We are led to assume that the epithelial cell is capable of existence outside the body for variable periods of time, if we are to explain the infection that resides for a time in cancer houses and districts. Dr. Lack's experiment may, however, represent part of the truth in regard to the phenomena of malignancy, and for the present we must await its confirmation.

Returning now to the theory of irritation, we may look at the matter from another point of view, and consider whether in place of non-specific irritants we may not have some *definite specifi* *cause of the disease*, that by its continued stimulus will account for the progressive growth, both locally and in distant parts, of the tumour. In this case such irritations as tooth-stumps, chronic ulceration, and the like, are to be regarded rather as a predisposing than as an actual exciting cause of malignant disease.

The question becomes a little clearer, if, instead of taking a long-continued irritation as the suggested cause, we take one definite injury. The frequency with which a history of some injury is given as the cause of a sarcoma is so frequent, that we cannot neglect it. We would refer especially to the valuable work of Dr. William Coley on the subject.

We may fairly ask why a blow or injury to a bone should in one case set up acute suppurative periostitis, in another chronic tuberculous disease, whilst in a third a sarcoma results. In the two former we now know that the blow is the predisposing cause only, the actual cause being a specific organism in each case. It is hard to resist the suggestion that in the third case we may also have as the essential factor some specific organism.

The analogy between tuberculosis and malignant growths is so well known, and has served so often as a basis for the view that these latter are due to some infective agent, that we need do little more than call attention to the fact. There is scarcely a feature in the one disease that has not its counterpart in the other. That cancer has, like tuberculosis, a local origin, is an accepted fact, for on it all our treatment of the disease at present depends. The mode of spread in both is similar, either by the lymphatics or by the blood stream. Even general miliary tuberculosis is simulated by cases of what are known as general sarcomatosis and carcinomatosis.

The points of resemblance have been well worked out by Shattock and Ballance. These authors point out how glandular infection without obvious primary lesion is seen in both, and give as an example those cases of epithelioma in the inguinal glands of chimney sweeps, in which no primary growth is discovered. The latency of infection in the glands is also common to both. We have recently seen a case in which growth has made its appearance for the first time in the axillary glands, three years after removal of the breast; and such cases in which the infective agent has apparently remained latent for years are by no means uncommon.

The appearance of a sarcoma, following a single definite injury, is on all-fours with the similar appearance of a tuberculous lesion under the same circumstances. We have seen cancer of the tongue following an injury with a pipe stem, and in one case a skin carcinoma resulting very quickly from an injury which caused bruising and grazing of the cheek.

And, lastly, we have the cachexia. This condition is, as a rule, so closely associated in our minds with poisoning from infection with some micro-organism, that it may be considered an important point of resemblance between cancer and the infective diseases.

We shall now proceed to consider what positive evidence we have, both clinical and experimental, of the infectivity of growths, leaving the question of the infective agent itself for later consideration.

Accidental inoculation in the same individual.—So many cases have been recorded of accidental inoculation in man, either from contact of a healthy surface with a cancerous one, or as the result of operative interference, that we may regard the possibility of this occurrence as beyond doubt. Numerous examples have probably fallen under the observation of most surgeons. Such, for example, as the infection of the cheek from an epithelioma of the tongue, of one lip from the opposite one, of the vagina from the cervix uteri, and of a lower part of the alimentary tract from the upper.

Quite recently we have seen a small nodule of growth in the vagina near its lower end, evidently secondary to a carcinoma of the cervix, and but a short time ago an epitheliomatous mass on the alveolar process of the upper jaw opposite to and secondary to an epithelioma of the tongue. Cripps has recorded a case in which an epitheliomatous ulcer developed on the arm of a patient suffering from ulcerated carcinoma mammæ, the ulcer occurring where the arm lay in contact with the breast growth. We need not give any further instances, as we are convinced this mode of infection is known to all.

Of *accidental inoculation as the result of operative interference*, many cases have been put on record. In cases given by Reincke and Quincke and others, carcinoma has developed in the punctures made to relieve cancerous peritonitis, and Sippel (quoted by Roswell Park) has published a case in which cancer inoculation took place along each one of the suture tracks after abdominal section for removal of a cancerous ovary. The same thing has been recorded several times as occurring in an abdominal scar after removal of ovarian tumours. In one case we have seen, in which the chin and lower jaw were split for the free removal of an epithelioma of the tongue, recurrence of growth took place in the centre of the scar in the chin.

The possibility of reinfection during the course of operation for malignant growth is now so well recognised by many surgeons, that if by any chance they cut into the growth they most carefully cleanse the wound and use fresh instruments, dealing exactly with the case as though it were infective in character.

A particularly instructive instance is quoted by Roswell Park, of a case under the care of a New York surgeon, in which carcinoma developed along the lines of incision made in the skin to relieve tension and allow the edges of a large wound resulting from an operation for the removal of a cancer to come together. These incisions were made with the same knife that had been used for the removal of the cancer, and the incisions had been in this way infected with carcinoma from the original growth.

Experimental inoculation in the human subject.—Infection from one part to another of the same individual has not only occurred accidentally, but has been shown to be possible experimentally. Hahn, in 1886, cut out three fragments from an inoperable cancer of the breast, and transplanted them to the opposite breast. The woman died three months later, and a microscopical examination of the nodules which had developed at the site of inoculation showed that they had the same structure as the original tumour.

Cornil, in 1891, recorded a similar case, in which a successful transplantation from one breast to the other of a spindle-celled sarcoma was performed by some surgeon.

These cases of accidental and experimental inoculation can leave no doubt in our minds as to the possibility of reinfection of an individual from an existing cancer, and also provide us with a most useful object lesson of the results that may follow operations for removal, if the most scrupulous care in providing against reinfection is not attended to.

Bosc, quoted by Roswell Park, mentions that in three instances carcinoma has been experimentally communicated to healthy individuals, but he gives no details.

Infection from one individual to another and the local distribution of cancer.—We now come to the question of infection from one individual to another, and with this is bound up the occurrence of cancer affecting many people occupying the same locality or house. Too many cases have been recorded now for us to look upon this in the light of coincidence. Even if we regard these as comparatively few in number, we must remember that it is only within the last few years that anything like prominent attention has been drawn to the subject. Further, the results that have attended the careful investigations of a few observers, such as Arnaudet, Wickham, Legg, and others, are most encouraging. One main source of difficulty in establishing the source of infection lies in our want of knowledge with regard to the incubation period. That the infection may remain latent for years in an individual, is shown by the long period that sometimes elapses between removal of cancerous growth and its recurrence either locally or in the glands. Moreover, it is not at present possible to say whether infection always occurs direct from individual to individual, or whether the causative agent is capable of retaining its vitality, or even of undergoing some portion of its life history outside the body.

In spite, then, of the difficulties that beset us in our attempts to trace the source of infection, cases present themselves from time to time that are difficult of explanation on any other view than that of direct infection. A striking example is given by Dr. Hall. A Miss S. was operated upon on 27th May 1885 for a tumour of the upper jaw, that was found microscopically to be a giant-celled sarcoma. She died as the result of the operation. Mr. J. A. was engaged to Miss S. for some months before her death. On 9th September of the same year (four months later) he had an operation performed for a tumour of the right superior maxilla, that, on microscopic examination, turned out to be a giant-celled sarcoma.

M. Guelliot has collected seventy-seven cases in which there was strong reason to suppose that infection from some one previously affected had taken place, and it is worth noticing that in seventy-one of these the two affected were husband and wife.

One of us saw, some years back, a man with epithelioma of the tongue, for which the organ was excised. This man's wife had had her tongue removed some year or so previously for what was said to be cancer.

M. Guelliot gives numerous interesting examples. One case communicated by M. Dève was that of a man æt. 38, who was attacked with cancer of the tongue. He had been in the habit of smoking the pipes of his father-in-law, who had died some years back of an epithelioma of the face. A similar case is quoted by M. Fabre from the practice of Dr. Mollière.

Budd[1] has reported that five surgeons of the North Devon Infirmary, who died in succession of the disease, contracted it from their patients.

But still more remarkable examples have attended investigations upon the frequency with which cancer occurs in certain districts and even houses. D'Arcy Power has collected together many striking examples of localised cancerous outbreaks, and many others have been published both here and abroad. Space prevents us from giving more than one or two examples, but they will serve to indicate the character of the remainder. Dr. Roy (quoted by M. Fabre) relates a series of deaths from cancer, of people inhabiting the same house, in a village in the Ardennes. The husband died of cancer of the rectum in 1870, the wife of cancer of the breast in 1873, a servant of cancer of the breast in 1873, and the father-in-law of cancer of the rectum in 1875. Mr. Law Webb has put on record some equally striking cases. In one series, extending over a number of years, from 1866 to 1891, six people, who inhabited two houses under one roof, died of cancer.

Of the influence upon cancer mortality of certain geographical formations, we must refer to the work of Haviland and others. There seems to be no doubt that it is more frequent, as Haviland states, "in the shallow and low-lying vales traversed by fully formed rivers, and having sites liable to floods, and composed of more recent geographical formations, in which clays of different ages predominate."

Thus locality is seen to be a distinct factor, but whether it has a predisposing influence by exercising some depressant effect upon the individual, or whether the organism is better enabled to live, or undergoes some portion of its life history outside the body in such districts, we are unable at present to say.

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[1] *Lancet*, London, Dec. 31, 1887.

Whatever way we look at the matter, however, we can have but little doubt but that we are dealing with some *materies morbi*, and that, as D'Arcy Power says, those cases raise a strong presumption in favour of cancer being an infectious disease.

Experimental work.—A large number of experiments have now been performed, to show the possibility of transference of growth from one animal to another, with a considerable amount of success, and some interesting results have thereby been obtained.

In most cases published, the successful inoculations have been from animal to animal of the same species. Of the possibility of this, our own experience in the matter confirms the results of other observers. When, however, we come to reported cases of transference of growth, either from man to the lower animals or between animals of different species, the results of experiments are open to more doubt. The descriptions of the tumours obtained are often so meagre, or else could be equally well explained on the hypothesis that the deposits obtained were inflammatory in nature, that for the present we must regard the question of inoculation of animals of different species as not yet proved. One case quoted by Dr. Hall is, however, worth drawing attention to. A woman was in the habit of cleansing every day an ulcerated medullary sarcoma in an ox. She acquired a tumour on the fourth finger of the left hand, which Kuhn examined and found to be a medullary sarcoma.

Cases in which successful infection of the lower animals from man occurred have been reported by Langenbeck, Follin and Lebert, Goujon, Mayet and Bosc. Speaking of these experiments, Shattock says "no authentic instance (that is, none satisfying modern criticism) is at present forthcoming of the grafting of human carcinoma upon any of the lower animals." He, in conjunction with Ballance, carried out a large number of experiments on these lines without obtaining any positive results. Ruffer and Plimmer were likewise unable to transfer carcinoma from man to the lower animals.

Though the large number of negative results obtained cannot be held to dispose of the few positive ones, it would suggest caution in the acceptance of any such recorded cases without the fullest details.

It is not difficult to obtain successful results from inoculation in animals of the same species. In 1876, Novinski made twenty-seven inoculations of a growth which he says was a carcinoma in a dog's nose, into subcutaneous tissues, with positive results in two cases. The growth that resulted resembled in structure that of the primary growth. Hanau's experiments with rats deserve special attention, as they appear to us to be the only undoubted examples of the transference of carcinoma. We have very little doubt that some of the other recorded cases of carcinoma are really sarcomata of an alveolar type. Hanau successfully transferred squamous-celled carcinoma growing in the vagina of a rat to a series of other rats. An illustration from a photograph of one of the rats, showing the infected peritoneum, is given in a paper by Shattock and Ballance, and these authors state that they have examined the sections, which were typical squamous-celled carcinoma.

A considerable number of experiments have been performed with the growths that occur not very infrequently on the genital organs of dogs, which we have elsewhere described as having the structure of round-celled sarcoma. These often present a well-marked alveolar arrangement, and this latter feature accounts for the facts that growths, apparently similar to the ones we have dealt with, have been described by other authors as carcinoma. Inoculation experiments have been carried out with these growths by Wehr, Geissler, and by Duplay and Cazin, portions of the growths being removed from the genital organs and transplanted to the subcutaneous tissues of other dogs. In many cases tumours appeared at the site of inoculation, resembling in structure the original growths. In two of the recorded cases, secondary deposits occurred in the viscera; a microscopical examination of the secondary tumours in one case showing that they possessed the same structure as the original growth.

We have carried out a considerable number of inoculations with the growths derived from the genitals of dogs. We have already published the details of the experiments, and shall consequently refer but shortly to what appears to us to be the most important points. The original growths on the genitals presented the structure of round-celled sarcomata, and their malignant character was shown by their tendency, if left alone, to infiltrate the vaginal walls, extending right through the muscular tissue and invading the perineum. And we may say at once that all the secondary tumours we obtained as the result of inoculation were identical in structure, nor was there any difficulty in distinguishing them at any time from inflammatory deposits.

In one batch of experiments we had thirteen successful experiments out of seventeen inoculations, tumours appearing at the site of inoculation. They ran a fairly rapid course, reaching a maximum of 1½ to 3 in. in about three months' time. From this time onwards retrograde changes took place, and the growth becoming soft and flabby, gradually disappeared in the course of another three months. In about half the cases this subsidence was accompanied by softening in the interior of the growth, with subsequent giving way of the skin and the discharge of a grumous material. It would appear that after the growth has existed for about three months, the dog acquires some power of resistance to its further extension. That some immunity does actually exist for a time, though for how long we are unable to say, we have shown by experiments. Four dogs that had been successfully inoculated were again inoculated after the subsidence of the original tumours, two of them on two occasions each, with results that were uniformly unsuccessful, though other dogs inoculated at the same time, as a control, with material from the same source, gave positive results. This immunity is interesting as giving us another point of resemblance between new growths and diseases that we know to be due to some specific organism.

We found that the growths could be transmitted serially through a number of animals. In one series the growth was transmitted through six dogs. There was no evidence, however, that the growth thereby altered in virulence or in any other particular.

For a considerable while we failed to obtain secondary deposits. The growths disappeared spontaneously, and we could not regard any of them as showing a malignant tendency. In one case, however, the growth ran a different course. Instead of subsiding at the end of three months, it continued growing, and the dog, which had been thin and weakly throughout, died at the end of six months, the growths at that time being about 4 in. long on each side of the abdomen in the subcutaneous tissue. At the post-mortem examination both the liver and spleen contained a number of small round nodules, varying in size from a millet seed to ⅓ in. in diameter. In structure these secondary deposits in the viscera were identical in all respects with the primary growth in the abdominal wall, namely, that of a round-celled sarcoma. No other cause for death was found, nor was there any evidence of inflammation or abscess formation about the viscera. That the tumours in this case continued growing and gave rise to secondary deposits, we attribute to the weakly condition of the puppy throughout, and to a lack of resisting power.

This case was important as showing us that the tumours resulting from inoculation were capable of presenting the same malignant tendency as the primary growths of the genital organs.

The benign course run by many of these growths, and their total disappearance, has its counterpart in man. Probably many of us present have seen growths which, from their clinical course, we have shrewdly suspected to be sarcomata, spontaneously disappear, and have then, in spite of our previous convictions and perhaps in face of a histological examination, concluded that we must have been mistaken in our diagnosis. There seems to be little doubt, however, that malignant growths do occasionally disappear. We have seen a spindle-celled sarcoma of the abdominal wall subside, only to recur later in an unmistakable form. Mr. Bennett has placed on record a most instructive series of cases of this kind. The majority of them were sarcomata, one only being a carcinoma, the structure of the tumours being verified microscopically.

That the tumours in dogs resulting from subcutaneous inoculation should run the course they do, is not to be wondered at. It is reasonable to regard healthy dogs as possessing some natural powers of resistance, and, in fact, as we have shown, some few could not be inoculated at all. It would appear that it is in highly bred dogs and in weakly ones with but little resisting power that the growths show the characteristics of invasion, both locally and of remote parts.

Parasites in cancer.—We will now consider what direct evidence we possess of the parasitic origin of malignant growths.

In the cells of malignant growths, appearances are to be observed which have been attributed to the presence of parasites. Some of these appearances occur in other conditions, and are caused by degeneration of the protoplasm; but, after eliminating such errors, the fact remains that in the cells of malignant growths, especially in carcinoma, bodies are present which are not found in other lesions, and which have the same morphology as micro-organisms belonging to the lower animal and vegetable kingdoms.

As far as their microscopical characters are concerned, they *may* belong to the class of Protozoa or to the class of Blastomycetes. It has for a long time been known that certain Protozoa are pathogenic to animals—for instance, the Coccidia which give rise to papillomatous growths in the liver of rabbits; and, by analogy, the bodies found in cancer cells were considered to be Protozoa. But these bodies, from their microscopical appearances, may equally well be Blastomycetes, and the tendency nowadays is to consider that they are of this nature.

It is obvious that histological methods are insufficient to determine what these bodies are. We will see how far experimental methods assist us in solving the problem.

The Blastomycetes are micro-organisms belonging to the vegetable kingdom, of which a well-known example is the ordinary yeast plant. There are a large number of different kinds, which have been isolated from various sources, and the pathogenic properties of which have been studied.

Several have been shown to be the cause of disease in the human subject, such, for instance, as the one described by Gilchrist and Royal Stokes, which produced a chronic inflammatory affection of the skin resembling lupus; and the one described by Busse, which produced a chronic form of pyæmia.

Sanfelice isolated a blastomyces from fermenting fruit juice, to which he gave the name *Saccharomyces neoformans*, and which was pathogenic to animals.

In guinea-pigs inoculation led to a general infection, and the micro-organisms could easily be cultivated from the tissues. Nodules were found, post-mortem, at the site of inoculation and over the peritoneum, consisting of accumulations of parasites, with a few cells and a little connective tissue.

Dogs were more resistant, and in a large proportion of cases the result of inoculation was negative. The most important experiments he has recorded were the inoculation of two dogs, one into the breast and the other into the testis.

The dog inoculated in the breast developed a tumour which microscopically had the structure of a duct or tubular carcinoma, the tubules being lined with columnar epithelium. In the adjacent lymphatic gland there were deposits of similar structure.

The dog inoculated in the testis developed a large mass, in which it was impossible to discover any testicular structure. Around this mass there were a number of metastatic nodules, and there was a large one in the neighbourhood of the glans penis. The tumours, on microscopical examination, were found to have the structure of an adeno-carcinoma.

In another series of experiments Sanfelice injected cultivations of the *Saccharomyces neoformans* into the veins of dogs. Nodules, consisting of cells, which apparently were mesoblastic, were found in the kidneys. In the lesions in the dogs a few parasites were found on microscopical examination, but they could not be cultivated. Sanfelice explains this by supposing that the *Saccharomyces* exists in two phases, in one of which it cannot grow outside the tissues of an animal.

It would appear from these experiments that the same organism is capable of giving rise to a tumour having the structure and behaviour of carcinoma, when inoculated into epithelial structures, and of giving rise to nodules derived from proliferation of connective tissue cells, when the mesoblastic structures alone receive its stimulus.

Plimmer cultivated from a human carcinoma a blastomyces, which when inoculated into the scarified surface of the cornea of rabbits, caused epithelial proliferation, and when inoculated into the peritoneal cavity of guinea-pigs gave rise to transparent nodules in the peritoneum, lungs, liver, spleen, and intestines. He describes these nodules as consisting of masses of endothelial cells with a round-celled infiltration around.

These experiments, combined with those of Foulerton and other observers, prove that several of the blastomycetes are pathogenic for animals. In most instances the lesions produced are of an inflammatory nature, in some cases with a preponderance of the fixed connective tissue cells. But from Sanfelice's description of the inoculation of dogs with the *Saccharomyces neoformans* an epithelial growth with malignant characters has been produced. If these experiments are confirmed by other observers, they will have the most important bearing upon the causation of cancer.

A number of observers have cultivated blastomyces from cases of cancer in the human subject. Most of these micro-organisms were non-pathogenic to animals, and it is probable that they were accidental contaminations. After a careful perusal of the literature, we do not feel satisfied that parasites, existing during life, have yet been isolated from cancers in the human subject.

A priori, there is nothing remarkable in a parasite causing a primary epithelial or mesoblastic growth. We know that bacteria may give rise to proliferation of epithelium and fixed tissue cells.

However, in malignant growths we have to explain why secondary deposits are of the same structure as the primary growth, independent of the tissue in which they are deposited. This can only be explained on the supposition that the cells and the parasites are together conveyed to distant parts, and that the cell is able to multiply in virtue of the presence of the parasite.

The fact that cells when transplanted are capable of limited multiplication, renders this view more easy to understand.

We may summarise the facts that we have now brought before you as follows:—

1. Malignant growths may be regarded as local in origin, and as possessing the power of infection of adjacent and distant parts of the individual.
2. Inoculation may take place from one part to another of the same individual, apart from transference by the natural channels.
3. There is good evidence to show that one individual may be infected with growth from another.
4. There is experimental evidence to show that growths may be transferred from animal to animal of the same species by inoculation.
5. There are found in many malignant growths bodies which have a resemblance to micro-organisms, and which have been regarded as belonging either to the Protozoa or the Blastomycetes.
6. A new growth, having the structure and also the behaviour of carcinoma, has been described as arising, at any rate in two instances, from inoculation, with a form of blastomyces.
7. These experiments are highly suggestive that the bodies found in cancer are the cause of the disease, though the evidence is wanting that definitely associates the two.

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PURULENT OPHTHALMIA.[1]

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Purulent ophthalmia may occur at any time of life, but the course of the disease is so much modified by the age of the patient that it is convenient to draw a clinical distinction between the purulent conjunctivitis of the adult and that of the newly-born child.

Ophthalmia neonatorum has its origin in specific contagion, and in all virulent cases a special micro-organism—the gonococcus of Neisser—is found not only in the pus cells, but also in the superficial layers of the conjunctival epithelium. All cases are not, however, necessarily of gonorrhœal origin, for severe attacks may occur where inoculation has taken place from non-venereal discharge. In its commonest form the disease is met with in infants whose eyes have been inoculated from the mother at the time of delivery; and though under these circumstances it usually makes its appearance during the first two or three days of life, yet it may set in either earlier or later, and exceptional cases are on record where, after a tedious labour with early rupture of the membranes, infection seems to have been *in utero*, and purulent discharge was well established when the child was born. If the first symptoms of the disease appear later than the fifth day, the probability is that infection has occurred, not at birth, but subsequently, by means of fingers, cloths, or sponges, which have been contaminated by coming in contact with lochial discharge. Infection may also pass from one child to another, and the disease be spread broadcast, by the neglect of an ignorant or careless nurse to keep her hands thoroughly clean while she is in charge of a case.

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Both eyes usually suffer, but in most instances one sooner and more severely than the other. The first signs are redness of the lids and lachrymation, and almost immediately thereafter the eyelids become swollen and glued together by sticky discharge. After twenty-four, or at most forty-eight hours, the redness is intense and the swelling so great that the eyes cannot be opened. The upper lid is distended and overhangs the lower, and the pus, from exposure to the air, dries into a crust which conceals the eyelashes. When the crust is removed and the lids are separated, the purulent secretion which has been pent up in the conjunctival sac gushes out so profusely that it wells over on to the cheek, and may even spurt into the operator's eyes. After this pus has been washed away, there remains hidden in the upper retrotarsal fold a stringy muco-pus, which is dislodged with difficulty. A few minutes after the eyes have been carefully bathed, a thin yellowish fluid mixed with blood collects rapidly in the conjunctival sac, and in less than an hour the purulent discharge is as profuse as ever. In some cases the secretion becomes plastic, and adheres so firmly to the palpebral conjunctiva that its removal leaves a bleeding surface.

The conjunctiva lining the eyelids is acutely inflamed, bright red in colour, and so much swollen that its normal transparency is lost. The hypertrophied papillæ are easily seen by the naked eye, and bleed very readily. The ocular conjunctiva is also red and œdematous.

The eyes will, unless cleansed with unfailing regularity, be kept continually bathed in pus, which will macerate and directly infect the cornea. The main object of treatment is to keep the cornea intact, and, with skilled care from the beginning, this may be readily accomplished, and the inflammation should run its course in from three to six weeks. The first sign of improvement is a diminution of the purulent discharge, and as this shows itself, the swelling of the lids subsides, and the child begins to open its eyes of its own accord. The palpebral conjunctiva, which is now thrown into folds and ridges studded with papillary granulations, will not, however, be restored to its normal condition for a considerable time, and spasmodic ectropion may temporarily remain even after the discharge has ceased. In a child at one time under my care, both upper lids remained for several weeks partially everted, and in the act of crying, as well as during sleep, the eversion of the left lid was complete.

A disease attended by inflammatory symptoms so acute, and by purulent discharge so profuse, is, as may be imagined, accompanied by constitutional disturbances, and though these vary according to the healthiness of the child in other respects, there are always present fretfulness, restlessness, disturbed sleep, and (if the symptoms be neglected and the illness prolonged) progressive emaciation, indicated by depressed fontanelles and drawn and shrunken features. In a few cases joint affections arise from metastasis.

If the disease be allowed to run its course untreated, corneal ulceration is inevitable; and if the swollen eyelids be livid, and the purulent discharge profuse and of greenish colour, the case is of an exceptionally grave character. It is at this period very difficult to separate the eyelids so as to obtain a good view of the cornea, and obviously such cases require very careful handling, as any awkward manipulation may precipitate perforation with all its serious consequences. At an early stage there is infiltration of the cornea, at first white, afterwards yellow, and as the epithelial covering gets destroyed pus begins to collect between the layers, and an ulcer forms, which extends over the surface, and if not checked, penetrates also deeply into the substance until the whole of the epithelium and the substantia propria are washed away, and nothing but the more resistent Descemet's membrane remains. By and by this also gives way, and the iris becomes exposed. In the worst cases, ulceration, commencing at the margin, advances steadily until it forms a complete ring, and as the ulcer may be in great part concealed from view by overlapping of the œdematous bulbar conjunctiva, the critical condition of the eye is not appreciated until the cornea, its nutritive supply being completely cut off, separates *en bloc.* Such a complication is followed by complete prolapse of the iris, and as the lens and vitreous humour usually escape at the same time, the eyeball ultimately shrivels.

As long as perforation has not occurred, energetic treatment may arrest the ulceration, and, the recuperative power of the cornea being at this early age very remarkable, the eye may recover its usefulness far beyond what might have been anticipated.

As soon as the ulcer begins to heal, its base becomes smooth; the dirty yellow colour disappears, being replaced by a pearly white; the breach of surface gradually fills up and becomes coated over by a new formation of epithelium; and only a smooth white cicatrix—leucoma—remains to mark the site. In an infant it is wonderful how completely even a dense leucoma may clear up, and the transparency of the cornea be more or less restored; but when perforation has occurred, the eye is always permanently damaged, the amount of the destruction depending upon the site of the ulcer and the behaviour of the prolapsed iris.

The following are examples of the most common sequelæ to ophthalmia neonatorum with perforating ulcer of the cornea:—

1. *Leucoma adherens with pyramidal cataract.*—A very characteristic case of this was that of a patient, a man over sixty years of age, who had, in the centre of the right eye—the result of purulent conjunctivitis in infancy—a dense white leucoma to which the iris was adherent. An iridectomy had been performed many years before, and through the opening thus made in the upper part of the iris a large pyramidal cataract was visible, with its base fixed upon the anterior capsule of the lens, and its apex drawn out into a fine white thread attached to the posterior surface of the cornea. These appearances are not difficult to interpret. During the progress of the ophthalmia neonatorum an ulcer formed in the central area of the cornea, and increased in depth until it caused perforation. After the escape of the aqueous humour the cornea became flattened, and lay in contact with the anterior capsule of the lens, and the two got glued together by an outpouring of inflammatory exudation. The opening being thus sealed over, the reaccumulating aqueous restored the anterior chamber, and as the cornea became pushed forward into its natural position the plastic inflammatory exudation was drawn out, and so a pyramidal mass was left stretching between the anterior capsule of the lens and the posterior surface of the cornea. Usually the cornea breaks away from the cataract, the apex of which thus becomes free.

2. *Adherent leucoma from the iris coming in contact with the breach of surface accompanying marginal corneal ulceration.*—It often happens that perforation checks the virulence of the disease, and immediately thereafter recovery begins. During the process of healing, however, the iris gets drawn towards the ulcer and becomes firmly fixed to the cicatrix, so that the pupil is hidden behind the leucoma. Sight may be restored by iridectomy, though, from the injurious action of the inflammation on the nutrition of the eyeball, more especially of the optic nerve and retina, the improvement in vision may come far short of what was anticipated. The following example may be given:—In October 1893, I operated on a boy, 4 years of age, who, as a result of ophthalmia neonatorum, suffered from a leucoma adherens in each eye so large and dense as wholly to cover the pupil. The intraocular tension was good, and as there seemed to be a fair perception of light, the formation of an artificial pupil was determined on. At the operation it was found that the vitreous was as fluid

as water, and drained away slowly, so that the eyeballs partially collapsed; but in twenty-four hours the wound closed and the globes resumed their normal appearance. The child's vision was undoubtedly improved, but not sufficiently to enable it to distinguish even large objects distinctly.

3. *Staphyloma anterior.*—Of cases of this, the following history of a child, 9 months old, affords a characteristic example. For some months before confinement the mother had suffered from a leucorrhœal discharge, which, so far as she was aware, was non-venereal, and by this the child's eyes were accidently inoculated during birth. Nothing abnormal was observed until three days after, when it was noticed that the right eye was inflamed and the lids glued together by a sticky discharge. Within a few hours the left eye became similarly affected. A permanganate of potash lotion was prescribed, but the treatment was carried out so inefficiently that the disease practically ran its course unchecked for nearly three weeks, when, during an awkward attempt to bathe the eyes, the mother noticed a clear substance (evidently the crystalline lens) escape from the right eye on to the cheek. She became so alarmed by the occurrence, that without further delay she brought her baby to the hospital. It was at once evident from the profuse discharge and the brawny livid swelling of the eyelids that the case was one of very exceptional gravity. Every attempt to separate the lids caused the child to cry vigorously, with the result that spasmodic ectropion occurred. The inner surface of the lids was then seen to be fleshy and granular, and so great was the protrusion of folds of chemosed conjunctiva that the eyeball was almost hidden from view. By means of retractors, however, the lids were opened, and the globes fully exposed, when it was seen that the corneæ were lost, and that the irides lay exposed and prolapsed. It was many weeks before the discharge ceased and the parts healed. In the right eye there was a dense flat white cicatrix, and in the left, from which the lens had not escaped, an anterior staphyloma so large and prominent that it interfered with the proper closing of the lids. As a result of the irritation thus produced, as well as from an increase in the intra-ocular tension, the child suffered much pain, which, however, was at once relieved after abscission of the staphyloma and evacuation of the lens.

4. *General distension of the eyeball.*—This may be illustrated by an account of the case of a girl, 10 years of age, who had suffered from ophthalmia neonatorum. She had now marked nystagmus; the sight of the right eye was rendered very defective by a central opacity of the cornea and an anterior polar cataract, and the vision of the left was completely destroyed through general distension of the globe. The latter eye was unnaturally prominent; the cornea had become expanded, its normal transparency was gone, and the sclerotic surrounding it

had become so stretched and thin that the choroid shining through gave it a slate-blue appearance. There was no anterior chamber, and the iris, so far as could be distinguished, lay closely against the posterior surface of the cornea, to which in the pupilary area it was firmly adherent. This condition is the result of inflammation of the uveal tract after purulent conjunctivitis, and was considered by the older ophthalmic surgeons to be a dropsy of the eyeball.

In addition to the above, nystagmus, strabismus, and impaired sight due to changes in the optic nerve and retina, may be mentioned as occasional sequelæ of ophthalmia neonatorum.

Notwithstanding the fact that more than a tenth of all blind persons have lost their sight as a result of ophthalmia neonatorum, the prognosis in this disease is eminently favourable, if the patient be skilfully treated before the onset of ulceration of the cornea. It may even be asserted that someone is to blame for every eye that is lost, for if proper precautions be taken from the very outset, corneal complications ought never to occur. Every case, therefore, no matter how mild the attack may seem, ought to be treated with all the care that would be bestowed upon one where the signs and symptoms were so acute as to call forth the greatest anxiety from the beginning. When, however, the cornea has become affected, there is great danger that the child may lose its sight, and the prognosis is consequently much less favourable, and depends upon the site and the extent of the ulceration.

In the treatment of a disease so eminently contagious, prophylaxis must always play a very important part. Indeed, if this were rigorously carried out, ophthalmia neonatorum might be made to disappear altogether. The name of Credé will always be associated with the prophylactic treatment, for the well-known methods introduced by him reduced the percentage of cases in the lying-in hospital at Leipzig from 7·5 to 0·5 per cent. To prevent infection of the eyes during parturition is the basis of all prophylactic treatment. The maternal passages must therefore be cleansed before accouchement by repeated irrigation with antiseptic solutions, and the eyes of the child ought to be thoroughly wiped and bathed as soon as possible after birth; and if there be any reason to suspect that infection may have occurred, a single drop of a 2 per cent. solution of nitrate of silver should be instilled into each conjunctival sac. Another great point in prophylaxis is that nurses and parents be duly impressed with the fact that no case of ophthalmia neonatorum can be trifled with, and a great advance would be made if they were compelled by law to notify every case immediately the first symptoms of inflammation declare themselves, so that the services of a properly qualified practitioner might be obtained. By means of such preventive legislation the number of cases could not of course be diminished, but prompt treatment would go far to lessen the number of those whose sight is impaired or altogether lost. It would, moreover, most effectually deter any midwife from dissuading parents from seeking medical advice early, instead of, as many do at present, paying no attention to the symptoms at the outset of the disease, and only taking alarm after the corneæ have burst and the eyes are destroyed.

The treatment of the disease itself consists principally in keeping the eyes clean and free from discharge. It is not enough for the surgeon to prescribe a lotion to be applied by the nurse. He ought at least once, and in bad cases several times, a day to bathe the eyes himself, making sure that every particle of discharge is washed away, more especially the stringy muco-pus which lodges in the upper and lower conjunctival *cul-de-sacs*. The particular eye-wash employed is not nearly so important as the personal attention on the part of the surgeon to see that all the discharge is thoroughly removed. Some lotions enjoy a greater popularity than others, but any weak antiseptic solution will serve the purpose of keeping the eyes clean. Personally, I prefer a saturated solution of boracic acid to which Batley's liquor opii sedativus is added in the proportion of 2 drms. to 8 fluid oz., but other collyria, *e.g.* bichloride of mercury 1 in 10,000, permanganate of potassium, formol 1 per cent., phenol ½ per cent., sterile saline solution, etc., are frequently employed. While its eyes are being bathed, the child's head should be placed between the knees of the surgeon, and its arms should be held against its body by the nurse. In this position the infant is under perfect control, and its eyes are easily cleansed by pledgets of absorbent cotton dipped in the collyrium. A syringe ought never to be employed, as its use is attended by danger both to the child and to the nurse. If there be much ulceration of the cornea, the nozzle of the syringe coming in contact with the ulcer may cause the eye to burst, and there is always a great risk that discharge from the child's eye may spurt from the syringe and inoculate the eye of the nurse.

Of all drugs, the one which most readily destroys the virulence of the disease is silver, which is most commonly used as a 2 per cent. solution of the nitrate. It may almost be regarded as a specific if thoroughly applied to the conjunctival surface of the everted upper and lower eyelids, making sure that the liquid reaches the retrotarsal folds. After the silver solution has remained in contact with the tissues for a few minutes, the eye should be thoroughly bathed with warm saline solution so as to neutralise any excess of the caustic. This application must be repeated twice a day as long as the discharge is profuse; but whenever the purulent secretion begins to lessen, a longer interval should be allowed to intervene between the applications, as the too energetic use of nitrate of silver is followed by the formation of a false membrane on the palpebral conjunctiva, owing to the coagulation of the discharge. Fortunately, corneal complications do not contra-indicate the use of nitrate of silver, whose chief virtue lies in its powerful bactericidal action. Its application, however, is always attended by much pain, owing to its caustic effect upon the superficial layers of the conjunctival epithelium. Of recent years another salt of silver, protargol—a combination of silver with protein—has been introduced. It also is a powerful germicide, and experiments have proved it to be particularly fatal to the gonococcus. It possesses advantages over nitrate of silver in so far that it is non-irritating, and causes very slight discomfort when instilled into the eye. It, however, penetrates deeply into the tissues, and thereby it reaches and destroys the micro-organisms which have become covered over by the epithelium. It must be remembered, however, that protargol contains only 8·3 per cent. of silver as contrasted with the 63·5 per cent. in the nitrate, consequently, as its action is of shorter duration, the application must be more frequently repeated. I usually employ protargol in 5 per cent. solution, and in this strength it causes practically no pain, and has no caustic action whatever upon the conjunctiva. My experience of this drug is so favourable, that I now employ it instead of nitrate of silver in all cases of ophthalmia neonatorum. In addition to the solution, an ointment of protargol is also used to smear the edges of the eyelids and prevent them from sticking together when the child sleeps.

If ulceration of the cornea develops, the treatment just described must be carried out more energetically if possible than before, and in addition atropine or eserine must be instilled, according as the ulcer is situated towards the centre or the periphery of the cornea; but the full details of the treatment of corneal ulceration will be given in a future lecture.

After the purulent discharge has ceased, astringent collyria, and the application of a crayon of sulphate of copper, speedily diminish the hypertrophied papillæ, and restore the conjunctiva to its normal appearance. These remedies, however, must on no account be employed if there be any progressive ulceration of the cornea.

Lastly, infants suffering from ophthalmia neonatorum must be carefully nursed and well fed, and in severe cases, when the cornea is sloughing, it is always advisable to prescribe small doses of stimulant—brandy—at regular intervals.

In the adult, purulent ophthalmia is always a much more serious disease than it is in the newly born, for while in the latter, corneal complications ought never to be allowed to occur, in the former, ulceration of the cornea cannot in many cases be prevented. Usually the disease is caused by the direct transference of gonorrhœal pus from the genitals to the eye, and the more acute the urethritis, and the fresher the pus with which the eye is inoculated, the more virulent will be the blennorrhœa of the conjunctiva.

Ulceration of the cornea—the complication most to be dreaded—arises much more frequently in the adult than in the child, because in the former the bulbar conjunctiva participates much more acutely in the inflammation. In the severest cases the conjunctiva bulbi becomes so infiltrated that its blood vessels are compressed by the exudation, and in consequence its colour changes from red to greyish yellow, and its surface is speckled with hæmorrhages, and at times coated with a fibrinous exudation. It surrounds the cornea like a collar, and, strangulating it at its source of nutritive supply, threatens its vitality from the very outset of the disease. Fortunately, all cases are not so virulent, the severity of an attack seeming to depend upon the activity of the infecting secretion, as well as upon the constitution and the previous habits of the patient. In every case, however, the occurrence of purulent inflammation of the cornea is to be feared, and obviously the more pronounced and the more solid the chemosis of the ocular conjunctiva, the more certainly may corneal ulceration be predicted.

As a rule, one eye only is affected at the beginning, for obvious reasons most frequently the right, consequently the first care of the surgeon when called upon to attend a case of purulent ophthalmia in the adult is to protect the sound eye from infection. This is best done by tying it up securely under a Buller's shield, and the patient should be warned on no account to allow his fingers or any soiled dressing to come in contact with the sound eye; and when he is asleep, care must be taken that he lies on the affected side, for fear pus may trickle over the nose from the inflamed to the sound eye.

From the very outset of the disease, the patient ought to be confined to bed in a well-ventilated room, and every care be taken that he is liberally supplied with nourishment. He ought to have a nurse beside him both by day and by night, as the whole secret of successful treatment depends upon the fidelity and thoroughness with which the cleansing of the eye is carried out. The nurses ought always to be well warned of the virulent character of the disease with which they have to deal, and of the risk to their own eyes if, by means of soiled fingers or the spurting of discharge from the patient's eye, they become inoculated.

The curative treatment consists in allaying the inflammation, in checking suppuration, in preserving the cornea, and in hastening the return of the conjunctiva to its normal condition.

First Stage—Stage of infection and incubation.—It is very difficult to say whether it is possible to cut short the disease once inoculation has taken place, but whenever it is suspected that the conjunctiva has become infected, the eye must be thoroughly bathed, and a few drops of a 2 per cent. solution of nitrate of silver instilled. The bathing dilutes the virus and so renders it less active, and the nitrate of silver not only exercises its bactericidal influence upon the gonococci, but by irritating the conjunctiva, it causes an increase in the number of leucocytes, which at once take up arms to repel the invasion of the tissues by the micro-organisms.

Second Stage—Stage of swelling and infiltration.—Pain is now very severe; the lids are red, swollen, and tense; the bulbar conjunctiva is chemosed and infiltrated; and the whole conjunctival surface secretes a large quantity of blood-stained serum. At this stage antiphlogistic treatment is clearly indicated. For the relief of pain, leeches to the temple, and opium internally, are of great value, and iced compresses should be applied to the eye, from which all discharge should be removed by frequent irrigation with ice-cold boracic solution. When the lids are so tense and swollen that their pressure is exercising an injurious influence upon the cornea, the external canthus should be freely divided, and in desperate cases the upper lid should be split vertically.

Third Stage—Stage of suppuration and ulceration.—As the signs characteristic of the second stage begin to subside, profuse purulent discharge flows from the conjunctiva. It is now that corneal complications are apt to set in, and in very acute cases involvement of the cornea may take place as early as the second or third day from the onset of the disease. Ulceration of the cornea is brought about partly by the pressure of the swollen tissues, and partly by maceration of the epithelium by the pus, so that a way is opened for the gonococci to invade the corneal substance, which soon becomes infiltrated. Usually an abscess forms in the centre of the cornea, or ulcers, which may become confluent, develop around its margin, often under cover of the chemosed conjunctiva.

When this stage of the disease has been reached, the application of ice should be discontinued, as the patient derives much more comfort from heat. The eye must therefore be fomented, and kept free from pus by frequent irrigation with hot solution of boracic acid. The sovereign remedy, however, is silver, either in the form of a 2 per cent. solution of the nitrate, or a 5 per cent. solution of protargol. These are of far more curative value than all the other disinfectant solutions in common use. Silver preparations must never be employed until suppuration is well established; but whenever the secretion is distinctly purulent, they must be thoroughly applied to the whole conjunctival surface, the frequency of the application being determined solely by the quantity of the secretion. If ulceration of the cornea occur, the treatment with silver nitrate or protargol must be continued and carried out with energy and faithfulness, and atropine or eserine instilled, according to circumstances. The former soothes the parts locally, and is the best prophylactic against iritis; while the latter, by reducing intra-ocular tension, does much to avert perforation of the ulcer. At the height of the disease, if it be possible to inspect the cornea, Descemet's membrane will be seen bulging through the floor of the ulcer. When this critical stage has been reached, any sudden movement of the head, a cough, or any unequal pressure of a bandage, will precipitate perforation, consequently the eye must be handled with the greatest care. Up to this point the patient's suffering has been agonising, but with the bursting of the cornea comes an immediate sense of relief, usually followed by sound refreshing sleep. This is frequently the turning-point in the course of the inflammation, and the amount of vision to be retained by the patient will naturally depend upon the extent of the ulceration and the size of the prolapse of the iris.

Fourth Stage—Stage of chronic inflammation and hypertrophy.—The inflammation and suppuration usually subside in from four to six weeks; but in most cases a condition of chronic inflammation of the conjunctiva remains. The lids are no longer swollen, but the palpebral conjunctiva is red, thickened, and granular, as a result of the hypertrophy of its papillæ. The retrotarsal fold is swollen, and the bulbar conjunctiva is hyperæmic—the white of the eye being streaked by large congested blood vessels. At this stage the use of the silver salts should be stopped, and astringent collyria substituted; and if the eye be not too irritable, the everted lids should be touched lightly once a day with a crayon of sulphate of copper. The patient must now be encouraged to go out of doors as much as possible, his eyes being shielded from strong light and wind by means of protection glasses; and quinine, iron, and other tonics should always be prescribed.

Under the influence of the treatment just prescribed, the conjunctiva is, as a rule, soon restored to its normal appearance; but in some cases the infiltration is not absorbed, and trachomatous degeneration follows the blennorrhœa. Some, indeed, affirm that all cases of trachoma arise from inoculation with modified gonorrhœal pus, and liken the cicatricial changes in the eye to those which lead to the formation of stricture of the urethra. The trachoma may be secondary to another infection; but if a pathogenic micro-organism be its exciting cause, it is certain that chronic blennorrhœa and not follicular conjunctivitis prepares the soil for the growth of the trachoma microbe.

Although known from time immemorial, trachoma began to attract the serious attention of surgeons only during the Napoleonic wars, when it appeared in epidemic form among the troops of the contending nations. It disabled thousands of soldiers, who, on being disbanded, returned to their homes, and spread the disease among the civil population. In those days the form it assumed was very acute, and as the contagion was conveyed by means of the secretion, the spread was most rapid where, as in public institutions, large numbers of people occupied the same sleeping apartments, and used wash-hand basins, towels, etc., in common.

Now-a-days the disease is rarely seen in this virulent shape, though as a chronic affection it is of frequent occurrence. Its natural home is in the countries of the East, and thence it has distributed itself over the whole civilised world. Damp and impure air exercise a great influence over its production; and while it is very prevalent in low-lying districts, it seldom or never occurs in regions like Switzerland. It is endemic among certain races, for example the Irish and the Jews, who, on account of poverty, live huddled together in small badly-ventilated houses, and pay but little attention to personal cleanliness.

The accompanying cases give illustrations of both the early and the late stage of the disease:—

Patrick R. was an Irish labourer, aged forty-two, in destitute circumstances, and very dirty. For years he had from time to time been troubled with "cold" in his eyes (which were always unduly sensitive when exposed to light and wind), and almost every morning he found that his lids had become glued together during sleep. The pain had, for six months before he came under my notice, been very considerable, and his sight had gradually become so defective that he was unable to work. The lids were slightly swollen, and the palpebral conjunctiva was red and rough from the injection of its blood vessels and the hypertrophy of its papillæ. The ocular portion appeared normal, except for congestion of its larger blood vessels; but in both eyes the cornea was nebulous throughout its whole extent, and its upper half was covered by a new formation of minute blood vessels, which gave it the appearance of red velvet—pannus. Only after the upper eyelids were everted was the true nature of the disease discovered. The palpebral conjunctiva was thick and fleshy looking, and studded with greyish white granulations, which varied in size, and were largest and most closely packed together in the outer third of the retrotarsal fold. These "sago-grain"-like bodies were partially concealed by hypertrophied and highly vascular papillæ. In the right upper eyelid a smooth whitish yellow spot, situated near the border of the lid, marked the beginning of cicatricial changes, which would, in the absence of appropriate treatment, have ultimately terminated in shrinking of the conjunctiva, and the alteration of its function as a mucous membrane—xerosis.

Other sequelæ of trachoma are illustrated in the second case, that of a man eighty years of age, who had been attacked by granular ophthalmia while serving in the army sixty years before. The disease had been at no time very acute; but the morbid changes in the conjunctiva had steadily progressed, until the membrane lining the inner surface of the eyelid was almost completely destroyed, and converted into cicatricial tissue. As a result of these changes, the tarsal cartilage was markedly incurved, and the upper lids were completely, and the lower ones partially, inverted. The alteration in the shape of the tarsal cartilage was accompanied by change in position and direction of the cilia, and every movement of the lids caused the misplaced eyelashes to rub against the eyeball. The ocular conjunctiva was inflamed, and a puriform secretion was hanging about the margins of the eyelids. As a result of this constant irritation, the cornea had become vascular through a new formation of blood vessels from the limbus; and its surface was besides so rough and opaque, that the iris could be seen through it only indistinctly, and the patient was in consequence so blind that he was unable to walk alone.

The third case is that of a man who had suffered from trachoma for many years. As a result of the long continuance of the inflammation, the conjunctiva had lost its natural moistness and become cuticular, the absence of the proper secretion producing a sense of dryness and grittiness, amounting almost to torture. The eyes were opened only with difficulty, as the retrotarsal fold was partially obliterated, and the lid was bound to the globe by bands of cicatricial conjunctiva. There was marked trichiasis; the lower punctum was obliterated; and the caruncle was much shrunk. The cornea was flattened, opaque, and traversed by numerous large blood vessels, and the vision in consequence so bad that the patient was barely able to grope his way about. The ocular conjunctiva was stained olive-brown from the long-continued use of nitrate of silver solution—argyria.

Treatment.—It is very rare now-a-days for trachoma to run an acute course with profuse discharge, and to appear in the epidemic form described by the writers of the beginning of the present century. On the contrary, the onset of the disease is in many cases so insidious that it passes unnoticed, and the patient seeks advice to obtain relief, not from inflammation and swelling of the lids, but from opacity of the cornea. During the stage of inflammation with suppuration, the treatment of trachoma is similar to that just described for purulent ophthalmia; but in the chronic stage the whole aim is to remove the infiltration of the conjunctiva as early as possible. Nitrate of silver is the best remedy as long as there is much secretion; but as soon as the discharge lessens, the silver solution should be replaced by sulphate of copper. Bluestone is a more powerful irritant than a 2 per cent. caustic solution, and it should not be employed when the cornea is infiltrated or ulcerated. It is of most use, therefore, in indolent cases with much hypertrophy of the conjunctiva. When the granulations are numerous and succulent, the everted lids should be massaged with boracic acid, or iodine ointment, 1 per cent., or protargol in 5 per cent. solution. The treatment must be faithfully carried out for months, or even years, until the disease is cured, for relapses are very prone to occur if the patient neglects to use the remedies as soon as he is free from feelings of discomfort. Juicy granulations may be destroyed by the cautery; but it is much better practice to express the trachoma granules from the retrotarsal folds by means of Knapp's roller forceps. Such operative measures help very materially to shorten the course of the disease; but in all cases the treatment is necessarily very prolonged, and as it consists so much in the use of caustics, it is necessary for the surgeon to apply them himself. The patient, however, ought always to be supplied with mild antiseptic collyria, so that the eyes may be kept thoroughly clean; and as the infiltration disappears from the conjunctiva, the more powerful caustics are applied less frequently, and in the intervals the use of ointments containing oxide of mercury, or protargol, or glyceroles of copper or of tannin, should be prescribed. As the conjunctiva improves, the pannus as a rule disappears; but if it be rich in blood vessels, these must be destroyed by the cautery. In dense pannus there is always a risk of iritis, so atropine must be instilled from time to time. When the cornea is vascular throughout its whole extent, and covered by a considerable development of new-formed tissue, resorption is sometimes obtained by exciting a violent inflammation, either by painting the everted lids with a 3 to 5 per cent. infusion of jequirity seeds, or by inoculating the conjunctiva with pus from a case of ophthalmia neonatorum. When trachoma has reached the stage of xerosis, it is quite incurable, and all that can be obtained by treatment is the amelioration of the patient's sufferings, by removing ingrowing eyelashes, and keeping the eye moist by the frequent use of lubricating ointments.

Every patient suffering from trachoma ought to be supplied with his own washing utensils, towels, etc.; and in schools and reformatories, those suffering from the disease must be rigidly kept apart from their fellows.

VALEDICTORY ADDRESS TO THE MEDICO-CHIRURGICAL SOCIETY, EDINBURGH.

By Sir John Batty Tuke, M.D., D.Sc., F.R.C.P.Ed.,
President.

The only onerous or difficult duty imposed on the President of the Medico-Chirurgical Society consists in the delivery of a valedictory address. From the excellent management of the council and secretaries, all the work of the Society goes on smoothly; hitches never seem to arise or difficulties to occur,—if they do, they are smoothed over by the diplomacy of these officers. Due to the energy of the Editor, the transactions appear with unerring punctuality, admirably arranged, and thoughtfully classified. As the result of the highly courteous tone which characterises the discussions, the president's function as moderator is uniformly pleasant in its exercise, inasmuch as the utmost good fellowship pervades even during the most animated discussions.

Before reviewing the work of the last two sessions, I have to thank the Society most heartily and sincerely for having elected me to this most honourable and comfortable office. Curiously enough, this is the first opportunity I have had of acknowledging this compliment, for on the occasions of election and re-election I was compelled by official duties elsewhere to be absent from the meetings at which I should have expressed my sense of gratitude. Whilst doing so, let me add that I deeply regret that the duties of the chair have been performed in a perfunctory manner. I have said that the prescribed duties are easy; but when I look back on the energy which my predecessors threw into their work, I recognise that the mere occupancy of this chair does not constitute the sole duty of the president. I can only plead long and serious illness, and the weight of advancing years, as excuses for my shortcomings.

The preparation of a valedictory address is, I suspect, in the majority of cases, not such an easy or agreeable task as the composition of an inaugural address. In the latter case one has the broad future before one, and the sentiment of Hope is more present to the mind; *illa quidem fallax, sed tamen apta dea est:* in the former, one has to deal with accomplished facts; and it almost inevitably happens that their consideration gives rise to mingled feelings of regret and satisfaction. In the retrospect of the last two years these feelings assert themselves strongly: satisfaction connected with the good work the Society has done, regret at the loss of members who in bygone years did much to support and enhance its efficiency.

During this period we have lost by death thirteen members, and amongst that number several men of mark. I do not propose to dwell long on this subject, but I am sure you would not wish that I should pass over in silence the names of men with whom the Society has been closely associated, or omit to express our deep regret at their loss.[1]

The material prosperity of the Society continues unabated. Notwithstanding the heavy death-roll, the number of ordinary members stands at 373; the total membership amounts to 416. There are vacancies in the lists of Honorary and Corresponding Members, and it will be your duty to consider on whom you will confer this honourable distinction. The treasurer informs the council that the report he will submit to you in due course will be satisfactory. We all regret that Dr. Mackenzie Johnston feels compelled to resign the treasurership, as also that Dr. Graham Brown demits office as secretary. I shall ask you later on to accord a special vote of thanks to these gentlemen for the admirable manner in which they have performed their duties.

Even a cursory review of the work of the last two sessions must convince any unprejudiced mind that the scientific spirit pervades the Edinburgh School of Medicine and Surgery very thoroughly. In every paper that has been submitted to the Society there is ample evidence of careful observation, deep thought, and deliberation. New facts and theories have been applied to the study of almost every class of disease, and to that of individual cases. The discussions have been animated, and at large meetings the members have expressed their opinions on the various theses freely and fairly, whether those opinions were adverse to, or in accordance with, the views of the author. The exhibition of patients, pathological specimens, and instruments has as usual constituted a large part of the work, and the special clinical meetings have been markedly successful. Like the previous occupant of this chair, Dr. Argyll Robertson, I must express a strong desire that some arrangement could be come to by which the two departments of the Society's work should not interfere one with the other. I do so in he interests of future presidents. Perhaps it is only those who have filled that office who can realise how painful it is to cut short a debate or restrict discussion in order that the agenda on the billet may be overtaken. It has frequently happened that, owing to the accumulation of exhibits, the reading of important papers has been delayed to such a late hour that their full consideration has been impossible. This appears to me to be hardly fair to men who have been engaged in the preparation of their dissertations for weeks or months, and for whom it may be necessary to present them at a special date. The council has considered the matter, and has instructed the secretaries either to call an extra clinical meeting, or to arrange, at least, one of the ordinary meetings so that the time may be equally occupied by exhibits and papers.

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[1] In this Address the obituary notices have been omitted, as almost all have already appeared in the Journal, and will be printed in the *Transactions* of the Society.

Many of the papers submitted to the Society have been of great importance and interest. The study of "The Pathology of a Fit of Gout" by Dr. George Balfour was characterised by the learning, extended knowledge of medical literature, and elegance of diction for which he has gained so high a reputation. It illustrated the truth of Cullen's position—that to render the association of practice and theory safe, it is necessary to cultivate theory to its fullest extent. I regret that circumstances closely connected with the subject dealt with, prevented me from hearing the paper read and discussed. Great interest attached to the paper on "The Etiology of Gout" by Dr. Chalmers Watson, who, it is understood, is continuing investigations which must tend to increase our knowledge of the subject. Dr. Claude Ker's consideration of "The Serum Diagnosis of Enteric Fever" was most welcome, and his description, written in association with Dr. Harvey Littlejohn, of "An Outbreak of Typhus Fever" must always hold an important place in the history of that disease. Dr. James' contributions on "Syphilitic Osteitis," "Tubercular Neuritis," and "Liver Cirrhosis" were illustrations of the careful and persevering methods of investigation so consistently followed by that very original thinker. Dr. Francis Boyd presented a singularly interesting communication on "Regurgitation at the Pulmonary Artery," which should have led up to thorough discussion;

this, however, was impossible in consequence of the late hour at which the paper was read. The papers on "The Acute Pneumonia of Children" by Dr. James Carmichael, on "Yellow Atrophy of the Liver" by Dr. Dobie, on "Rheumatic Myositis," and on "The Etiology and Treatment of Glandular Enlargements of the Neck" by Mr. Miller, and on "The Treatment of Ozæna" by Dr. M'Bride, aroused the interest of the Society, as shown by the full criticism to which they were submitted. To Dr. Allan Jamieson we are indebted for elaborate descriptions and illustrations of various forms of "Skin Disease," to Mr. Wallace for his paper on "Movable Kidney," to Mr. Alexis Thomson for his communication on "The Treatment of Enlarged Prostate," and to Mr. Cathcart for notes on "Peritonitis as a cause of Increased Peristalsis in the Rectum." Dr. Lovell Gulland in his paper on "Sulphonal Poisoning," collated all that was known of the subject with the phenomena presented by a case which had come under his observation. Under the modest title of "Some Observations on the Development of the Testicle," Dr. Foulis submitted a dissertation, founded on a prolonged and laborious investigation which will doubtless exercise important bearings on accepted views. We have been specially rich in dissertations on diseases of the nervous system. In certain instances the physician and surgeon, or the physician and pathologist, have collaborated in producing works which extend the horizon of our knowledge on the localisation of cerebral function, and of methods by which morbid conditions of the organ may be combated. The conclusions which Dr. Bruce laid before the Society in his paper "On the Localisation and Symptoms of Disease of the Cerebellum in relation to its Anatomical Connections" in what appeared to me a somewhat tentative and reserved manner, have met with confirmation by subsequent clinical experience. He is to be congratulated on this rapid realisation of the scheme propounded before the Society, which serves to confirm him in the distinguished position he holds amongst neurologists. The contributions of Mr. Miles, of Dr. Shennan, and of Mr. Cotterill have all important bearings on the diagnosis and treatment of intracranial disease. Finally, we must all recognise the high value of Dr. John Thomson's lecture on "The Diagnosis and Prognosis of Certain Forms of Imbecility in Childhood," which was followed by an excellent lantern demonstration.

It is somewhat remarkable that not one of the twenty-six dissertations submitted to the Society has touched on those medical matters which have exercised the public mind during the last two years. I allude specially to the vaccination question, the prevention of the spread of syphilis, and the arrest of tubercular disease. I believe that, as regards the first, the profession felt that it had said its say, and finding the incontrovertible evidence it had produced of the necessity for strengthening the Acts set aside for mere party purposes, and further finding its representatives in Parliament giving themselves and the position away, thought it wiser to let things swing. Perhaps it was wise so to do. I do not suppose you are all salmon fishers, so let me illustrate the position by reference to a manœuvre occasionally practised by the professors of that art. When you have hooked a big fish in a strong stream, and the fish will work down to a place where disaster is inevitable, it is a good plan suddenly to give him a few yards of line, when, believing himself to be free, he turns upwards, and you can guide him into calmer waters. This is what seems to have happened in certain centres of agitation, where we are informed that the conscientious objector is celebrating his victory by getting himself and his children vaccinated. It is one of those instances of paradoxical rightness which occasionally follows on reduction of strain; or, is it that the good sense of the nation is at last asserting itself?

Although the Society took no part in the vaccination question, it might be well were it to consider the propriety of taking action as regards the popular interest in tuberculosis and specific disease. It is interesting to compare the indifference with which the public relinquished the Contagious Diseases Acts, with the avidity with which it seized on proposals to deal with tuberculosis on general hygienic principles. Of course the reasons for this are not far to seek. The details of venereal disease are revolting, they must be spoken of with bated breath; and curious though not unnatural sympathies were aroused in connection with the means considered necessary for reducing its ravages. With tuberculosis, on the other hand, scandal is not associated, and its natural history can be discussed *coram publico.* The general recognition of the fact that a disease which makes itself so forcibly, frequently, painfully, and openly felt, is communicable, and that communication may be preventible, has created a special and wide-spread interest. That it is the duty of the medical profession to maintain that interest, no one will gainsay; but the best means of so doing is to express to the public opinions bearing not so much as to what could possibly be done under an ideal state of social existence, but as to what can be done under existing conditions, and so to lead gradually upwards from present imperfections to a nearer approach to the ideal. The public must be taught not to expect too much; it must be educated to a degree of knowledge which will enable it to adopt or refuse, on a rational understanding of the questions involved, measures which, however expedient for the common good, might complicate social relations. The community must be made to understand that, before any material decrease of tubercular infection can be expected, it has to face, amongst others, such serious social questions as compulsory notification and isolation. It has done so as regards other forms of disease, and unless a new class of faddist arises, it may adopt important precautionary measures as regards tuberculosis. The Town Council of Edinburgh has taken up the consideration of the question, and has consulted the Royal Colleges, who have reported very fully. Under these circumstances, it might be a work of supererogation for this Society to supplement this report at present: still, when the Town Council formulates a scheme, it should, in my opinion, be carefully considered by us, and the result of our deliberation should be forwarded to the municipal authorities. It would be of importance to the public to place on record the opinion of a body which comprises practitioners of Medicine and Surgery distributed over the country; and I think I am justified in adding that it is to the interest of the Society to make itself felt in all deliberations dealing with the health of the community.

SOME OBSERVATIONS ON THE EXCRETION OF URIC ACID, WITH SPECIAL REFERENCE TO ITS CONNECTION WITH LEUCOCYTOSIS.

By CARSTAIRS C. DOUGLAS, M.D., B.Sc. (Edin.), *Glasgow*.

NOTWITHSTANDING the large amount of work that has already been done with reference to the mode and seat of formation of uric acid within the body in mammals, it cannot yet be said that the last word has been spoken on this subject. The matter is one which possesses an interest alike for the physician and surgeon, since the behaviour of uric acid under varying physical and chemical conditions lies, to a large extent at least, at the root of the pathology of gout on the one hand, and of uric-acid gravel and calculus on the other. To the physiologist, also, the subject is one of some interest with reference to the regressive metabolism of nitrogenous bodies.

In nature uric acid is widely distributed in the bodies and excretions of animals. According to Hammarsten,[1] it is habitually present, in small and varying amount, in the urine of man; habitually in small traces in herbivora, frequently also in carnivora; it is abundantly present in the urine of birds and scaled amphibians, and is also found in the urine of insects and certain snails. In the present paper we are concerned only with the uric acid excretion in man.

It would occupy too much space to give even a brief account of all the views that have held sway regarding the place and mode of origin of uric acid within the body, but it may be well to consider briefly some of the theories of recent origin, since they embody, it is to be presumed, the result of our latest knowledge of the matter. Latham[2] advanced the following explanation of the origin of uric acid: normally, the glycocine of the bile is returned to the liver to become urea; if the liver were disturbed, glycocine might exist in the blood along with urea, and, after certain changes, ammonium urate might result from conjugation within the kidneys. This theory is based on the fact that ammonia and uric acid can be formed by heating glycocine and urea together, thus—

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[1] "Text-Book of Physiological Chemistry," 1895, p. 351.

[2] Croonian Lectures, "Pathology of Rheumatism, Gout, and Diabetes," 1886.

$$2CH_4N_2O+CH_2(NH_2)CO_2H = C_5H_4N_4O_3+3NH_3+2H_2O.$$

This theory has few supporters; it leaves many facts unexplained in connection with the uric acid excretion, and endows the kidneys with a function which it has not been proved they possess. Luff[1] is another supporter of the view that the kidneys are the seat of uric acid formation. In addition to its conjugation from uric acid and glycocine, as mentioned above, he suggests that it might result from the union of urea and tartronic acid, thus—$C_5H_4N_4O_3+4H_2O=2CH_4N_2O+C_3H_4O_5$. His view rests on the statement that uric acid is absent from the blood of birds and mammals, a statement which has been recently disproved by Chalmers Watson,[2] who found it distinctly present in the blood of the duck, goose, and turkey, and in minute traces in the lamb. Kolisch[3] may be cited as another who looks upon the kidneys as the seat of origin of uric acid. He considers it takes origin there from nuclein bases.

There is little evidence in support of the theory that the liver is the manufactory of uric acid in mammals, although its function in the formation of urea is clearly recognised. In Hahn and Nencki's[4] experiments on mammals (where the liver was thrown out of operation by an Eck's fistula), although the urea was diminished, the uric acid, after a temporary rise, fell to normal again. Roberts[5] suggested that uric acid might be of the nature of an embryonic residue in the functional evolution of the kidney, and that the mammalian organ had not yet reached its highest point in development. This view is only tenable if we continue to regard uric acid as having the same source and meaning in the economy in mammals as it has in birds; it is, however, generally recognised now, that uric acid in the latter finds its homologue in urea in mammals; and it is quite possible, and even likely, that uric acid in the latter takes origin in a totally different manner to what it does in birds and amphibians.

Haig's[6] views are well known in relation to the pathology of gout; he holds that the uric acid and xanthin bodies in the food pass as such into the blood, and are excreted in an unaltered state in the urine. He sees little to support the view that uric acid may be formed within the body, and maintains that in health it bears a fixed ratio of 1 : 35 to the urea, any departure from this being a deviation from the balance of perfect health. These views are not accepted by the majority of physiologists, and against them may be urged the following facts:—(1) Uric acid given to dogs increases the excretion of urea, not of uric acid;[1] (2) there is abundant evidence that various foods and drugs, free from uric acid or xanthin bases, can promote the formation of uric acid within the body; (3) it leaves many points unexplained, such as the high uric acid excretion in children and in cases of leucocythæmia, and the continuation of the output of uric acid during absolute fasting, as in the case of Succi, who, even after fasting forty days, continued to excrete uric acid.

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[1] Goulstonian Lectures, "Chemistry and Pathology of Gout," 1897.

[2] *Brit. Med. Journ.*, London, 1899, vol. i. p. 204.

[3] *Ztschr. f. klin. Med.*, Berlin, 1895.

[4] *Arch. f. exper. Path. u. Pharmakol.*, Leipzig, 1893, Bd. xxxii. S. 191.

[5] Croonian Lectures, "Uric Acid, Gravel, and Gout," 1892.

[6] "Uric Acid as a Factor in the Causation of Disease," 1897.

Marès' opinion is that uric acid is a product of molecular changes in protoplasm, especially in that of the digestive glands. He bases his view on the fact that the uric acid output becomes constant in the fasting state after a certain time (about thirteen hours), and that it is increased shortly after a flesh-meal, whereas the urea increase does not show itself till some hours later (usually nine),—that is, not until all the food has been assimilated. We shall see that another explanation has been given of these facts.

The theory of uric acid formation, however, which has awakened the greatest amount of interest of late years, and which is apparently supported by many clinical and experimental facts, is that associated with the name of Horbaczewski.[2] According to him, uric acid is derived in the body from the disintegration of proteids containing nuclein, notably from the leucocytes, and the plan of his argument, stated briefly, is as follows:—(1) Nuclein tissues outside the body can be made to yield the precursors of uric acid as well as uric acid itself. Splenic pulp can be got to yield xanthin bases by treatment with arterial blood at 40° C., and pure nuclein extracted from splenic tissue has also, on digestion with weak alkali, plus oxidation, yielded uric acid. (2) Those tissues which contain nuclein undergo destructive changes within the body. (3) In health the leucocytes are the chief of these tissues. (4) It is a well-known fact that in leukæmia, where there is an excess of leucocytes, the uric acid excretion is vastly augmented. (5) Quinine and atropine, which diminish leucocyte production and destruction, diminish the uric acid too. (6) Pilocarpine, which acts in the reverse manner, increases the uric acid output. (7) If, for example, after a flesh diet, the normal digestive leucocytosis be absent, the usual increase of uric acid after eating does not take place. (8) In other conditions besides leukæmia, where there is much destruction of nuclein-containing tissues, such as the cancerous cachexia, inanition, fevers, and phosphorus poisoning, the uric acid excretion is increased. (9) Lastly, nuclein given by the mouth increases the uric acid by increasing the leucocytes. Horbaczewski thus

[1] Schäfer, "Text-Book of Physiology," 1897, vol. i. p. 902.

[2] "Theorie d. Harnsaürebildung in Saügethierorganismus," 1892.

finds a remarkable parallelism between leucocytosis and the excretion of uric acid, and states that the latter is probably a decomposition product of nuclein-containing bodies. In addition to these facts thus arrayed by him, the following may be adduced:—

(1) In young children the uric acid output is proportionately greater than in adults, and the blood is at this time richer in leucocytes (Schiff,[1] Hutchison and Elder,[2] and others). (2) Alcohol, which increases the number of leucocytes, has been found by Camerer, Levison,[3] and others to increase the uric acid excretion. (3) Feeding with a tissue rich in nuclein, such as the thymus of the calf, augments the uric acid output (Umber)[4]; this is corroborated by Giajinis,[5] who found no xanthin bodies in thymus, but noted an increase in the leucocytes after its administration. (4) Milroy and Malcolm[6] found that nucleic acid caused a hyperleucocytosis with consequent increased leucolysis, with the result that there was an increase in formation of alloxur bases. Of the total alloxuric nitrogen, it appeared to be the uric acid which was most markedly increased. (5) Bohland[7] found, after the administration of sodium salicylate, a marked increase in the leucocytes, sometimes from 80–100 per cent., and an increase in the uric acid of 60–84 per cent.

The fact that the uric acid excretion rises to a maximum two to three hours after a meal, while the urea does not do so till some six hours later, is explained by Horbaczewski and his followers, on the ground that the former is due to digestive leucocytosis, the latter to the disintegration of albuminous substances in food ingested and absorbed.

This view that uric acid is connected with the nuclein-containing tissues, and probably, mainly with the leucocytes, and that it is not a result, or at least only so to a slight extent, of the katabolism of nitrogenous tissues, such as muscle, has evoked much interest, and has been regarded with favour by not a few physiologists.

Schäfer[8] thinks it probable that the nucleo-proteids which occur in all mixed diets, and of which caseinogen and egg-yolk are examples, yield uric and phosphoric acid from their nuclein-parts. Hammarsten[9] speaks of the close relationship of the spleen to the formation of uric acid, and admits also the relationship of leucocytosis to it. Bunge[10] says it is quite possible that uric acid may be a product of the metabolism of leucocytes; he thinks the xanthin bases undoubtedly belong to the antecedents of urea and uric acid, as they occur in too large quantity in the tissues and too small amount in the urine to be eliminated unchanged.

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[1] *Ztschr. f. Heilk.*, Berlin, 1890, Bd. xi.

[2] *Trans. Edin. Obst. Soc.*, 1894–95, vol. xx. p. 154.

[3] "The Uric Acid Diathesis," 1894, p. 57.

[4] *Ztschr. f. klin. Med.*, Berlin, 1896, Bd. xxix.

[5] *Brit. Med. Journ.*, London, 1898, vol. ii. epitome.

[6] *Journ. Physiol.*, Cambridge and London, 1898, vol. xxiii. p. 229.

[7] *Centralbl. f. innere Med.*, Leipzig, 1896, S. 70.

[8] *Op. cit.*, p. 870.

[9] *Op. cit.*, p. 132.

[10] "Text-Book of Physiological Chemistry," 1893, p. 341.

Schmoll,[1] again, supports this hypothesis, and gives it as his opinion that cells destroyed in the body yield nuclein, from which uric acid is derived, while it is also obtained from substances in food, such as theine and caffeine, which contain the alloxur ring.

Lastly, we may quote Ebstein,[2] who says that in an ordinary attack of gout there is considerable destruction of nuclein, and that the uric acid is derived from this.

On the other hand, there have not been wanting objections to Horbaczewski's theory, some of them of a sufficiently weighty nature. Richter,[3] for example, points out that, according to Horbaczewski, the maximum excretion of uric acid after food corresponds with the maximum number of leucocytes, whereas it should really follow the latter, if due to a breaking down. This is explained by Löwit, on the ground that a *hypoleucocytosis* goes before the increase, the uric acid therefore being formed presumably during this hypoleucocytosis. Richter's objections to this explanation are—(1) There is no microscopical evidence of breaking down; (2) hyperleucocytosis may exist without a preliminary hypoleucocytosis; (3) where hypoleucocytosis does exist, it may depend, not on a breaking down of cells, but an altered distribution from periphery to centre. He thinks the theory only holds good for a certain number of cases.

Again, it has been pointed out that if the uric acid be due to disintegration of leucocytes, in cases where the former is increased, the phosphoric acid excretion should be also augmented. But exactly the converse way may take place, as in a case of leucocythæmia studied by Milroy and Malcolm,[4] where, along with a marked leucocytosis (average 330,000 per c.mm.) and some increase in the uric acid and alloxuric bases, the excretion of P_2O_5 was diminished to one-fourth of the normal, indicating that the leucolysis was diminished rather than increased. Bohland in a recent paper[5] gives the results of some investigations into the uric acid excretion under the administration of certain drugs, capable of increasing or diminishing the number of leucocytes. He discovered that it did not always follow that increase of leucocytes led to increase of uric acid. For example, although antipyrin and phenacetin caused an increase in the leucocytes, the uric acid remained the same. On the other hand, salicylate of sodium, atropine, and pilocarpine agreed with Horbaczewski's view. Bohland thinks that these last-named drugs act essentially by affecting the metabolism of nuclein within the body.

Finally, Wiener,[6] in a recent paper, dissents from Horbaczewski's opinions, and found that, although uric acid was formed in the spleen and the thymus, it was produced much more abundantly in the liver; also that an alcoholic extract of liver which contained no xanthin bodies, when added to fresh liver, distinctly increased the quantity of uric acid produced.

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[1] *Centralbl. f. innere Med.*, Leipzig, Oct. 1898.

[2] *Deutsche med. Wchnschr.*, Leipzig, November 1898.

[3] *Ztschr. f. klin. Med.*, Berlin, 1895, S. 290.

[4] *München. med. Wchnschr.*, April 1899.

[5] *Op. cit.*, p. 234.

[6] *Arch. f. Path. u. Pharmakol.*, Leipzig, Bd. xlii. S. 375.

During the past eighteen months I have made a considerable number of clinical observations on this point under various conditions of health and disease, such conditions being specially selected which afforded an opportunity of studying the uric acid excretion where leucocytosis was present.

I take this opportunity of acknowledging my indebtedness to Dr. Finlayson and Dr. Beatson, who, amongst others, afforded me special facilities for procuring material, the former in the Western Infirmary, the latter in the Cancer Hospital.

The observations may be collected under two heads:—(1) Variations in the excretion in health under different conditions of diet, etc.; and (2) Variations in disease. It will be well first of all to set out the results in tabular form, and thereafter to note shortly the conclusions that may be drawn from them.

From the clinical observations in Table I. the following general conclusions may be drawn:—

1. In ordinary health, with a mixed diet, the uric acid output is distinctly increased one and a half to three and a half hours after food, digestive leucocytosis being present about the same time (Obs. 6–9).

2. The output may rise even though the diet contain no nucleo-proteid (Obs. 10–12). This is not in accordance with Camerer's experience, who found no rise in the uric acid if pure egg-albumin were given.

3. Where a vegetable diet, rich in proteid, was given (peas, beans, lentils, etc.), the total output of uric acid was little, if at all, inferior to that under ordinary mixed diet. The usual rise took place three hours after food, but digestive leucocytosis was feeble or absent (Obs. 16–23).

4. Where a vegetable diet, poor in proteids, was given, the daily output of uric acid was, on the whole, below that on mixed diet; the usual rise two to three hours after food showed itself distinctly, however, and digestive leucocytosis occurred on at least one occasion (Obs. 24–33).

5. On a plentiful meat diet, both urea and uric acid were increased in much the same ratio, and the leucocyte count tended to keep high (Obs. 34–35).

6. Where thymus of the calf, or solution of nuclein was administered along with ordinary diet, the uric acid output was very notably increased (Obs. 36–39).

7. Patients who were fasting absolutely after laparotomy showed a varying excretion of uric acid, sometimes much, sometimes little, below the normal.

TABLE I.—*Variations in Uric Acid Excretion under Varying Conditions of Diet, etc.*

No.	Sex.	Age.	Bodily Conditions.	Diet.	Total Day's Excretion in c.c.	Urea, per Cent.	Uric Acid, per Cent.	Urea, Total.	Uric Acid, Total.	Ratio of Urea to Uric Acid.	Leucocytes.
1	M.	30	Good health.	Ordinary, mixed.	1086	2·6	0·06	28·93	0·634	1 : 45	6000 per cmm. (fasting).
2	,,	,,	,, ,,	Urine of early morning (fasting).	...	2·96	0·12	at rate 31·10	of 1·29	1 : 35	...
3	,,	,,	,, ,,	Ordinary, night urine.	920	2·90	0·080	12·76	0·35	1 : 36	...
4	,,	,,	,, ,,	Ordinary, day urine.	,,	2·95	0·090	14·16	0·43	1 : 32	...
5	,,	31	Violent bodily exercise.	Ordinary, mixed.	880	4·15	0·094	36·52	0·83	1 : 44	7,500
6	,,	,,	Fasting.	Night urine, diet ordinary.	1090	2·3	0·047	at rate 25·07	of 0·51	1 : 48	7,500
7	,,	,,	1½ hours after breakfast.	Ordinary, mixed.	...	2·4	0·120	26·16	1·318	1 : 20	7,500
8	,,	,,	3½ ,, ,,	,, ,,	...	3·1	0·127	33·79	1·384	1 : 24	10,270
9	,,	,,	5½ ,, ,,	,, ,,	...	2·75	0·085	29·97	0·932	1 : 32	10,830
10	,,	,,	Night urine.	After ordinary mixed meal.	960	3·50	0·056	at rate 33·6	of 0·539	1 : 62	5,900
11	,,	,,	2½ hours after meal.	110 grms. egg-albumin.	...	3·77	0·105	36·24	1·01	1 : 36	10,000
12	,,	,,	5 ,, ,,	,, ,,	...	3·50	0·104	33·6	0·99	1 : 35	6,700
13	,,	,,	Night urine.	After ordinary mixed meal.	1070	2·10	0·102	at rate 22·47	of 1·09	1 : 22	5,500
14	,,	,,	2½ hours after meal.	50 grms. each, egg-albumin and yolk.	...	2·00	0·109	21·40	1·17	1 : 20	7,800
15	,,	,,	4½ ,, ,,	50 grms. each, albumin and yolk.	...	1·90	0·90	20·30	0·96	1 : 20	8,000
16	,,	,,	Mixed, night urine.	After ordinary mixed meal.	1000	3·15	0·067	at rate 31·5	of 0·675	1 : 46	7,700
17	,,	,,	3 hours after meal.	Vegetables, rich in proteids.	...	3·45	0·384	34·5	0·843	1 : 40	6,600
18	,,	,,	5 ,, ,,	,, ,, ,,	...	2·90	0·073	29	0·730	1 : 45	7,000
19	,,	,,	Total day's excretion.	,, ,, ,,	1000	3·13	0·072	31·36	0·722	1 : 43	...

								at rate	of		
20	„	„	Night urine, mixed.	After vegetable diet, rich in proteids.	...	2·75	0·067	27·5	0·675	1 : 41	...
21	„	„	3 hours after meal.	„ „ „	1150	3·0	0·098	34·5	1·13	1 : 30	5,000
22	„	„	5 „ „	„ „ „	...	2·0	0·065	23·0	0·75	1 : 30	5,000
23	„	„	Total day's excretion (2nd day).	„ „ „	1150	2·3	0·058	26·61	0·702	1 : 38	...
								at rate	of		
24	„	„	Mixed, night urine.	After non-proteid meal.	1150	3·2	0·067	36·80	0·74	1 : 48	8,300
25	„	„	3 hours after meal.	Non-proteid vegetable diet.	1245	3·45	0·130	42·95	1·61	1 : 27	11,300
26	„	„	5 „ „	„ „ „	...	2·85	0·076	35·48	0·94	1 : 37	10,500
27	„	„	1 to 11 p.m., same day.	Same diet.	...	1·66	0·041	20·66	0·512	1 : 40	...
28	„	„	Total day's excretion.	Vegetable diet, poor in proteid.	1245	1·88	0·045	23·42	0·558	1 : 42	...
								at rate	of		
29	„	„	Night urine after day of	„ „ „	1245	1·85	0·028	23·40	0·358	1 : 70	7,700
30	„	„	3 hours after meal.	„ „ „	1420	2·65	0·109	37·63	1·547	1 : 26	8,300
31	„	„	5 „ „	„ „ „	...	2·50	0·089	35·5	1·272	1 : 28	...
32	„	„	1 to 11 p.m. same day.	„ „ „	...	1·15	0·041	16·33	0·585	1 : 28	...
33	„	„	Total day's excretion.	„ „ „	1420	1·42	0·050	20·17	6·711	1 : 28	...
34	„	32	Good general health.	Abundant meat diet.	1155	3·3	0·080	38·11	·926	1 : 41	12,000
35	„	„	„ „	„ „	1230	3·3	0·079	40·59	·977	1 : 41	...
36	„	„	„ „	Ordinary mixed and thymus.	827	3·5	0·125	28·77	1·035	1 : 29	...
37	„	„	„ „	„ „	1060	2·64	0·103	28·62	1·09	1 : 26	...
38	„	„	„ „	Ordinary and nuclein solution.	1230	2·15	0·077	26·44	0·89	1 : 20	...
39	„	„	„ „	„ „	1500	2·27	0·072	34·12	1·09	1 : 31	...
40	F.	26	After laparotomy.	Absolute fasting.	180	1·60	0·031	2·88	0·056	1 : 51	...
41	„	44	„	„	510	3·80	0·072	15·30	0·367	1 : 40	...
42	„	35	„	„	568	3·75	0·107	21·30	0·545	1 : 37	...

Where a series of observations has been made, the average result has usually been given.

TABLE II.—*Variations in the Uric Acid Excretion in Disease.*

No.	Sex.	Age.	Bodily Condition.	Diet.	Total Days' Excretion in c.c.	Urea, per Cent.	Uric Acid, per Cent.	Urea, Total Grms.	Uric Acid, Total Grms.	Ratio.	Leucocytes.
1	F.	16	Diabetes mellitus.	Almost pure proteid.	5340	1·15	0·043	61·41	2·29	1 : 30	Average, 6000–7000 per c.mm. while fasting.
2	,,	,,	,,	,,	4200	1·10	0·030	46·20	1·26	1 : 45	
3	,,	,,	,,	,,	4200	1·10	0·022	46·20	0·945	1 : 49	
4	,,	,,	,,	,,	3580	1·15	0·023	41·07	0·851	1 : 48	
5	,,	,,	,,	,,	4940	1·22	0·046	60·26	2·27	1 : 26	
6	,,	,,	,,	,,	4540	1·20	0·018	54·24	0·841	1 : 63	
7	M.	20	Diabetes mellitus.	Proteid diet.	3975	1·20	0·030	47·70	1·19	1 : 40	Average, about 12,500 per c.mm.
8	,,	,,	,,	,,	4250	1·27	0·025	53·97	1·06	1 : 53	
9	,,	,,	,,	,,	4080	1·20	0·024	48·90	0·995	1 : 50	
10	,,	,,	,,	,,	4310	1·02	0·018	43·90	0·775	1 : 56	
11	F.	11	Diabetes mellitus.	Largely proteid diet.	2670	1·30	0·022	34·71	0·60	1 : 58	Average, about 13,000 per c.mm.
12	,,	,,	,,	,,	3180	1·40	0·022	44·52	0·72	1 : 60	
13	,,	,,	,,	,,	2725	1·75	0·020	47·68	0·54	1 : 90	
14	,,	,,	,,	,,	2610	2·00	0·028	52·20	0·83	1 : 62	
15	M.	...	Large splenic tumour.	Light diet.	1475	1·6	0·034	23·60	0·501	1 : 47	7,500
16	F.	...	Enlarged spleen.	Ordinary mixed.	1820	1·17	0·032	21·38	0·567	1 : 48	2,000
17	F.	29	Good general health.	Ordinary mixed.	1160	1·6	0·082	18·56	0·952	1 : 20	7,000
18	,,	,,	3 months pregnant.	,,	630	3·0	0·106	18·90	0·668	1 : 28	15,000
19	,,	,,	4 ,,	,,	905	2·0	0·082	18·10	0·772	1 : 24	12,770
20	,,	,,	5 ,,	,,	900	2·4	0·078	21·60	0·700	1 : 30	23,880
21	,,	,,	6 ,,	,,	950	2·3	0·092	22·32	0·875	1 : 25	28,000
22	,,	,,	7 ,,	,,	510	2·1	0·095	10·71	0·487	1 : 22	14,400
23	,,	,,	8 ,,	,,	800	1·8	0·093	14·4	0·750	1 : 19	18,000
24	,,	,,	9 ,,	,,	935	2·0	0·086	18·70	0·789	1 : 24	18,000

25	F.	52	Cancer of breast.	Ordinary mixed.	625	1·45	0·061	9·00	0·400	1 : 22	12,000
26	,,	45	,, uterus.	Light diet.	625	1·45	0·696	9·09	4·351	1 : 2	Great increase.
27	M.	50	,, liver.	Milk diet.	2215	1·55	0·017	34·33	0·376	1 : 92	13,800
28	,,	58	,, gullet.	Milk and soup.	850	3·50	0·102	29·75	0·871	1 : 35	8,600
29	,,	32	,, jaw.	Ordinary mixed.	1465	2·10	0·071	30·77	1·043	1 : 30	14,000
30	F.	63	Multiple sarcoma.	Light diet.	1390	0·97	0·013	13·54	0·193	1 : 70	5,000
31	M.	58	Cancer of tongue.	Ordinary mixed.	1135	1·67	0·064	19·01	0·727	1 : 26	5,500
32	,,	,,	,, throat.	,,	1475	1·70	0·061	25·07	0·901	1 : 27	22,700
33	F.	42	,, stomach.	Light diet.	1475	1·93	0·063	28·56	0·934	1 : 30	6,600
34	M.	45	,, liver.	,,	596	3·75	0·159	22·35	0·950	1 : 23	...
35	,,	47	,, stomach.	,,	680	1·75	0·067	11·99	0·440	1 : 29	12,700
36	,,	19	Recurrent sarcoma.	,,	765	3·30	0·093	25·24	0·710	1 : 35	9,440
37	,,	53	Cancer of gullet.	Milk and soup.	995	3.50	0·088	29·95	0·776	1 : 34	15,000
38	,,	47	,, omentum.	Light diet.	1730	2·00	0·018	34·60	0·324	1 : 106	11,000
39	F.	52	Fibroid of uterus.	Milk diet.	525	2·80	0·067	15·22	0·354	1 : 43	8,800
40	F.	22	Marked chlorosis.	Light diet.	375	2·10	0·097	12·54	0·560	1 : 22	8,000
41	,,	23	,,	,,	1760	1·40	0·048	24·64	0·858	1 : 29	16,600
42	,,	16	Chlorosis.	,,	1475	1·10	0·032	16·22	0·483	1 : 33	9,000
43	M.	63	Marked anæmia.	,,	925	1·90	0·036	17·57	0·346	1 : 50	12,700
44	,,	40	Cirrhosis of liver.	Mixed diet.	455	3·00	0·078	13·65	0·357	1 : 38	8,300
45	F.	38	Hepatic hypertrophy and anæmia.	Milk diet.	1135	1·50	0·072	17·87	0·821	1 : 21	5,000
46	,,	37	Anæmia and jaundice.	Light diet.	1250	1·10	0·037	13·75	0·464	1 : 29	5,500
47	M.	18	Hypertrophic hepatic cirrhosis.	,,	1050	3·20	0·097	33·60	1·030	1 : 33	6,500
48	,,	55	Marked anæmia and jaundice.	,,	1465	1·10	0·026	16·84	0·384	1 : 44	5,000
49	,,	50	Pneumonia, second day.	Milk and soup.	1250	1·20	0·060	15·00	0·750	1 : 20	5,000
50	,,	35	,, at crisis.	Light diet.	850	3·80	0·174	32·3	1·470	1 : 22	4,400
51	,,	20	,, just after crisis.	,,	2045	1·50	0·048	30·66	0·980	1 : 31	15,000
52	F.	25	,, shortly after crisis.	,,	1650	2·00	0·063	33·00	1·050	1 : 33	12,000
53	M.	19	,, third day after crisis.	,,	1075	3·50	0·087	37·60	0·930	1 : 40	7,000
54	,,	43	Chronic plumbism.	Mixed diet.	1930	1·40	0·034	27·02	0·665	1 : 45	10,000
55	,,	48	Obesity.	Light diet.	1135	1·65	0·061	18·72	0·701	1 : 27	14,000

1. In diabetes mellitus the uric acid was mostly found to be distinctly increased, and the more so the richer in proteid the food was. It was not increased in proportion so much as the urea (Obs. 1–14).

2. In two cases of splenomegaly, the amount excreted was little if anything below normal; in one of these cases a very distinct leucopenia was present (Obs. 15–16).

3. A case watched throughout pregnancy revealed a constant and distinct leucocytosis, while the uric acid was in no wise increased (Obs. 17–24).

4. In cancer, as a rule, a leucocytosis occurs; there appeared to be no constant relationship between it and the uric acid excretion in the cases examined (Obs. 25–39).

5. In various cases of anæmia and diseases of the liver, the uric acid output was on the whole low, and the leucocyte count normal or subnormal (Obs. 40–48).

6. In pneumonia the amount of acid excreted was high on the whole, and in several instances the leucocytes were raised in number (Obs. 49–53).

On the whole, there is a discrepancy between the amount of uric acid thrown off from the body and the number of leucocytes. No doubt there are striking instances in which there appears to be a marked parallelism between the two; but, on an equal number of occasions, the converse can be shown to hold true. That nuclein-containing tissues on ingestion may increase the amount of uric acid excreted, is proved by the effect of administration of nuclein and of thymus, but the observations I have made do not support the view that normally the source of uric acid is to be found in the nuclein of the leucocytes.

One fact which these analyses impress upon one is, that uric acid varies much less with diet than urea does, and that the ratio between the two is a very elastic one. A practical lesson that may be learned from them is, that in prescribing a diet for the gouty, care should be taken to indicate that vegetables are not to be taken promiscuously, as is too often done, but that those poor in proteid should be selected, and also that sweetbread and similar tissues rich in nuclein should be rigorously excluded.

VALEDICTORY ADDRESS TO THE EDINBURGH OBSTETRICAL SOCIETY.

By J. Halliday Croom, M.D., F.R.C.P.Ed., *President.*

My first duty in returning to your hands the trust which you so generously placed in mine two years ago, is to express my profound thanks for the honour you then did me, and for the special mark of kindness and consideration which you showed me during my tenure of office.

My term of office has not been marked by any special features, except, alas! by one, that during the last two years the death-roll has been heavier than during any other similar period of the Society's history. Death has spared neither those who had long sought retirement, nor those engaged in the busy round of everyday life. No less than twenty-four members, honorary, corresponding, and ordinary, have been called away during the last two years. It would be impossible for me to refer in detail to each of the fellows whom death has claimed, but it would be altogether wrong if I were to pass on without some little notice of the honorary fellows.[1]

The last two years have been a record of steady work in the Society, but I hope you will bear with me while I occupy a few minutes of your time by trying to impress upon the younger fellows the advantages to be derived from taking a personal interest in the Society. Our Society has fallen too much into the hands of specialists. This is not as it ought to be, because, though gynæcology is a speciality pure and simple, obstetrics is not so, and appeals and must appeal to every general practitioner of medicine. Although the backbone of every Society must always be the scientific papers which are there read, and there are few societies in which more good scientific work has been done than in the present one, yet at the same time these purely scientific papers must and can only be of interest to those specially interested in the department. Short clinical papers and clinical evenings and subjects for discussion seem to me to be the subjects which will be most interesting to practitioners generally. The institution of clinical evenings would perhaps be a novelty. We could not, of course, expect to introduce here what has everywhere else proved an unqualified success, namely, the exhibition of living specimens; but even that is not an impossibility. I do not see in the least why a doubtful tumour in the living person should not be seen here and examined and discussed, any more than a similar tumour is exhibited and discussed at the hospital before fifteen or twenty students. There is no impropriety in the one any more than in the other, if indeed there is any impropriety in either.

Though material for clinical evenings such as I have suggested may not be very plentiful, yet short clinical papers would make an evening very practical and useful. Dr. Haultain's suggestion of discussing specimens for any length of time, subject to the discretion of the President, was a move in the right direction, and one which I hope will be taken full advantage of. Our Society has not to suffer from what many of the London Societies have to complain of, namely, that the papers that are read here are published in the *Transactions* only, perhaps a considerable time after the interest of the paper has ceased. Here we place no embargo on the paper being published anywhere the author pleases immediately after it has been read, nor does such previous publication preclude its appearance in the *Transactions*. Furthermore, the selection of subjects for discussion would from time to time give fresh interest to the Society; the subject being announced beforehand would enable the fellows of the Society to think the matter over and to prepare observations and reminiscences worthy of the occasion. It is not given to every one to grasp the tenor of a long paper rapidly read, nor can the majority of men prepare and deliver on the spur of the moment a clear account of what they know on the particular subject. Nobody realises more than I do how difficult it must be for the secretaries always to keep the agenda paper filled, and when one remembers the limitations of our branch, and the fact that we meet every month, as often as the Medico-Chirurgical Society which draws from every branch of medicine, gynæcology included, I think we may congratulate ourselves on the energy of the Society. Still, I venture to believe that the suggestions which I have thrown out might be useful in extending the scope of our Society amongst practitioners. Our Society possesses a very liberal roll of members, yet the attendance at our meetings is by no means numerous, and I venture to attribute this to the fact that the scientific and operative sides of obstetrics and gynæcology can only interest a few, and although such subjects ought to form by far the most predominant feature in the Society, yet I believe the development of the more clinical side would attract a larger number of members.

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[1] In this Address the obituary notices have been omitted, as almost all have already appeared in the Journal, and will be printed in the *Transactions* of the Society.

So far as this Society is concerned, this is the last valedictory address, the last time your President will have an opportunity of saying farewell to you this century. Although I have no intention whatever of inflicting upon you a synopsis of the work done and advances made between the dawn and the setting of the century, yet I may be allowed very shortly to make reference to some of the more prominent advances.

No doubt, gentlemen, since the early days of this century there has been magnificent progress in obstetrics, but, after all, if you look back, it will be apparent to you that almost every one of the operations performed by obstetricians, nay more, the very instruments themselves, were all foreshadowed ere the century dawned. With the revolving years, of course, there have been mighty improvements, improvements in technique in operation, and in the instruments themselves, but yet, great though these improvements have been, no very original operations, no absolutely original instruments have been devised, as far as obstetrics is concerned. The forceps have been modified, altered, improved, beyond a doubt. The scope of their use as a life-saving instrument has been enormously increased, but yet the forceps is two centuries old at least. The operation of embryulcia has been improved in various ways, but the operation of embryulcia is as old as the time of Hippocrates. The operation of turning is as old as Ambroise Paré, and the induction of premature labour was a recognised operation before this century began. The operation of symphysiotomy, as originally suggested by Leverin Pineau in 1575, or as modified by Sigault and Le Roy in 1768, was an operation which at that time was with justice condemned, but as recently produced it has an unquestionable future before it. The American operation of gastro-elytrotomy is an improvement upon an operation which was introduced by Jörg in the beginning of the century.

Though these operations in a more or less crude form were practised before the century began, yet it is needless to point out to you the great improvements in all those operations. Axis-traction forceps have rendered delivery possible with almost scientific accuracy. A closer acquaintance with the mechanism of labour, and an early recognition of pelvic deformities, has made it possible for the practitioner now to avoid a sacrificial operation by the induction of premature labour, or the performance of Cæsarean section, and to recognise the necessity for these operations and to undertake their performance while the patient is yet unexhausted and her tissues uninterfered with, and not to wait, as formerly, until the patient is exhausted by futile attempts to deliver in some other way.

Cæsarean section has made enormous advances. It is now possible to deliver a woman with extreme pelvic deformity by this method, with a mortality of perhaps 10 or 12 per cent.; whereas at the beginning of the century the mortality could not be much less than 90 per cent. This is in a large measure due to the labours of Sanger.

Taking again those cases of less extreme deformity, it is possible now to save the child by means of the operation of symphysiotomy.

The operation of turning, in itself a very old operation, has been simplified and improved, thanks specially to the work of Braxton Hicks, by the introduction of the bipolar method. The adoption of this bipolar method of turning has no doubt, specially in the cases of placenta prævia, saved hundreds of lives.

Perhaps the greatest of all improvements is not in operative obstetrics, though that is great enough, but rather in prevention. One is struck all round with the enormous advance of preventive medicine generally: the prevention of smallpox, typhoid, diphtheria, and so forth. But preventive medicine has advanced in obstetrics as well. At the beginning of the century puerperal fever was the scourge of our lying-in hospitals. Now the death rate has been reduced, in properly conducted hospitals, so far as puerperal septic fever is concerned, to practically nil. It is true that in private practice it seems to go on unabated. Dr. Cullingworth has drawn up statistics pointing out this very significant fact.

To what are all these advances due? What has made these advances possible? In the first place, chloroform has made it possible to use the forceps more carefully, and to perform the other operations to which I have had occasion to refer, with greater care and skill, and has helped greatly to make Cæsarean section the success it is. And the other potent factor in rendering these operations safe and in reducing mortality, is the almost universal use of antiseptics in hospitals and in private.

Gynæcology, unlike obstetrics, was born during the century, and although, therefore, but a young branch of science, its development has been rapid and its achievement most brilliant. To chloroform and antiseptics it is as much, if not more, indebted as its sister branch of obstetrics. It may safely be said that without those two, abdominal surgery would be an impossibility. Abdominal surgery really began with ovariotomy. Perhaps the origin and development and progress of ovariotomy is the most striking advance in surgery, whether gynæcological or otherwise. Performed first at the beginning of the century by Ephraim M'Dowell, and then by Clay of Manchester, whom we know as the father of ovariotomy in Europe, it never, however, became recognised as an established or legitimate operation until it was taken in hand by Spencer Wells. Others did occasional operations, but it is really to Spencer Wells that ovariotomy owes its first legitimate start. Wells had performed ovariotomy before the introduction of antiseptics, but it was not until 1858 that Spencer Wells published his first remarkable series of cases which established ovariotomy as a justifiable operation.

Perhaps no department of surgery benefited more by the introduction of antiseptics than did abdominal surgery; but ovariotomy had been an established operation for twenty years before antiseptics were known. The magnificent work of Keith and Tait, and of men who are still with us, is too well known to require any allusion from me, and if the century had seen no other development or improvement but that of ovariotomy, that in itself would have been an event worth recording.

After the introduction of antiseptics, abdominal surgery advanced in all directions; but nevertheless, looking back on the history of ovariotomy, I think we can say, with a certain amount of pride, that abdominal surgery is mainly due to gynæcology.

The surgery of the liver, the gall-bladder, the kidney, the stomach, the bowels, the appendix, are all directly due to the development of ovariotomy. Antiseptics have undoubtedly removed the great risk of abdominal surgery, and practically made it possible to do anything in the abdominal cavity, provided there is no uncontrollable hæmorrhage, or no absolutely irreparable lesion.

Tait opened up a wide field in dealing with diseased ovaries and tubes, and led the way to a clear pathology of the extra-uterine tissues. One must stop to record the enormous advance there has been made in our knowledge of extra-uterine pregnancy; that of itself is an epoch-making advance. In the early days of this century, our knowledge of that subject was simply chaotic, and now an extra-uterine pregnancy can be diagnosed and dealt with, with not only a reasonable, but an almost certain amount of security. No doubt all these operations upon diseased tubes and extra-uterine pregnancy have been overdone, but there is just as little doubt that our knowledge of those subjects has now become so focussed that the really important cases can be diagnosed and dealt with, and the others to a great extent left severely alone.

It would be unpardonable to omit an allusion to the method of dealing with fibroid tumours by removal of the uterine appendages; that was an original idea of Tait's, and has been adopted and crowned with lasting success. The advances likewise in dealing with uterine fibroids by complete removal by the various methods of hysterectomy, either by the vaginal or abdominal route, pan-hysterectomy and its various modifications, have almost opened a new era in gynæcological surgery.

With regard to the minor class of operations, it would be going far beyond the scope of a short address like the present, to go into any details about them. Though less important, perhaps, and less striking, they are none the less useful. They are the development of the last three decades of the century.

Gentlemen, I have no desire to detain you longer. In a farewell address like the present, I cannot be expected to go into all the details of the various improvements in technique, but to anyone who is interested in gynæcology, and who ventures to review it during the last half-century, which really marks its birth and development, one cannot fail to be impressed with the fact that a whole department, though so recent in its origination, has been fraught with such enormous benefits to the human race.

In demitting this chair, and in passing on the torch from this century to the next, I can only congratulate you most heartily and sincerely on the choice of my successor—Dr. Milne Murray. He belongs to a younger race of brilliant gynæcologists who will uphold and advance the branch which he adorns. It is to me a matter of pride to know that he was my pupil, my assistant, and my best of friends, and in asking him in your name to occupy this chair, I do it with a feeling of pride, and at the same time with an assurance that he will enhance the reputation of the Society of which he is now the President.

NOTE ON FEBRILE ALBUMINURIA, AND THE QUESTION OF A SPECIAL RHEUMATIC ALBUMINURIA.

By F. Parkes Weber, M.D., F.R.C.P., *Physician to the German Hospital, Dalston.*

Recently I saw it stated in a medical journal, that "rheumatic albuminuria" was a somewhat indefinite form of "renal lesion," and that in rheumatic cases, when albuminuria occurs, if not due to real renal disease, it will in all probability be "febrile albuminuria" pure and simple. It seems to me that the latter part of this criticism on the term "rheumatic albuminuria" is itself a little obscure. I grant that the term "rheumatic albuminuria" merely signifies an attack of albuminuria occurring simultaneously with an acute febrile articular disorder resembling rheumatism, but does "febrile albuminuria" mean anything more than albuminuria accompanying (not necessarily caused by) a febrile state of the body? I hardly think it can be still maintained that the so-called "febrile albuminuria" is merely caused by pyrexia. It seems much more likely that, in most cases at all events, it is due to the causes of the pyrexia, whatever they may be. Surely it is no rare occurrence to find albumin absent from the urine of very febrile patients, and even in the hectic fever of advanced phthisis, albumin is not invariably found. On the other hand, albumin may occur in the urine from temporary digestive disorders and "bilious attacks" not usually characterised by fever. During such attacks, if the urine were more frequently tested, a moderate cloud of albumin would, I believe, be not very rarely found.

The real, or at least most probable, explanation of all this seems to me the following:—The kidneys may secrete an albuminous urine from the local presence of irritants or from any toxæmic condition of the blood, and such toxæmic conditions of the blood may be due to infectious (microbic) causes, or may be the result of any kind of abnormal tissue change in the body. Though it seems highly probable that in most febrile cases the albuminuria, when present, is not directly due to the pyrexia, but that both pyrexia and albuminuria (supposing the kidneys to be previously free from organic disease) are due to a common cause, namely, some abnormal condition of the blood supplied to the kidneys; yet there can hardly be a doubt that the effect of the same abnormal state of the blood on the temperature and urine will be very different in different patients, and will depend on individual reactive peculiarities. Thus, whilst in many cases pyrexia may be accompanied by considerable albuminuria, in other cases of the same disease either the fever or the albuminuria may be almost or completely absent; at all events, the degree of albuminuria bears no constant relation to the fever, except perhaps in the case of any single patient during the course of the same disease.

I will now consider the case of a middle-aged man, who had an obstinate form of, at times acute, at other times chronic, articular rheumatism, each acerbation or relapse being accompanied by albuminuria and fever. The following are short notes of the case, for part of which I have to thank Dr. P. Krieg, one of the resident medical officers when the patient was in the hospital:—

J. H., æt. 41, a pianoforte worker, was admitted to the German Hospital on 10th January 1899, with articular rheumatism. The patient had suffered from pain in the right ankle for about six days. Some years previously he had had an attack of rheumatism. At the age of 18 he had a venereal sore (soft chancre?), and during childhood he apparently was affected with scrofulous glands under the jaw.

Condition on admission.—Patient is, on the whole, well-developed, but has scars under the jaw, possibly from scrofulous glands during childhood. The corneæ show slight opacities, possibly from old phlyctenular keratitis. He has a chronic affection of the nails, similar to what Unna speaks of as "scleronychia." The nails have a coarse fibrous texture and irregular growth. The finger nails show longitudinal ridges, and some of them are partially separated from their beds; the toe nails have an irregular surface and a coarser texture than the finger nails. This condition of the nails is not accompanied by any affection of the skin, except that there is some tendency to varicose eczema or varicose pigmentation in the legs. Temperature, 105° F. Right ankle-joint swollen and tender, and the skin over it reddened. By auscultation over the heart a mitral systolic murmur can be made out. The lungs show nothing abnormal.

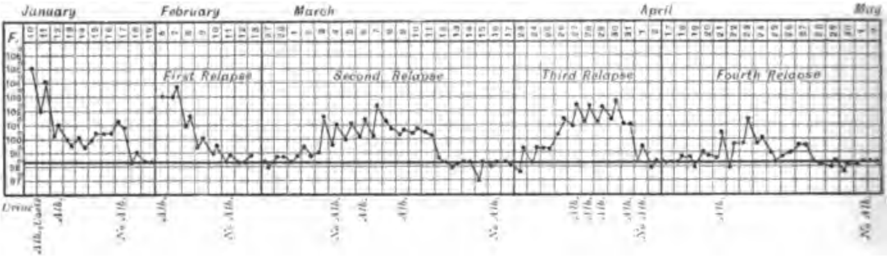
Urine.—Quantity diminished, acid, specific gravity 1020, no sugar, a fair amount of albumin, and casts. The patient improved under treatment (rest in bed, milk diet, salicylate of sodium, Vichy salt).

On 17th January there was pain again in the left foot and right shoulder, but the urine contained neither albumin nor casts. On the following day there was no fever. On the 21st January some meat was allowed. On 30th January patient was quite free from pain and could get about naturally; the urine only contained the very faintest trace, if any, of albumin.

The patient was allowed to leave the hospital on 1st February, but on 6th February he had to be readmitted with a relapse. The temperature was found to be 103° F. Both hands and knees were painful and swollen, and there was some albuminuria. Rapid improvement followed treatment by sodium salicylate, etc. On 11th February there was no fever and no albuminuria, and the articular swelling was less.

Patient was up and about, and for several days had taken ordinary full diet, when, on the morning of 2nd March, he felt pain in the right shoulder; temperature, 99°·2 F. Next day the whole right arm and elbow were painful, and the temperature in the evening was

101°·4 F. On the day following (4th March) there was pain in the right knee likewise. No albumin could be yet found in the urine, but two days later (6th March) there was a little. On the 9th March the urine was of specific gravity 1026, acid, and contained a cloud of albumin. On 12th March there was no fever, and the urine, when tested on 16th March, was found to be free from albumin (specific gravity 1020, acid); still a little pain in the right shoulder and small joints of the right fingers.



Temperature Chart in the case of J. H.

The third definite febrile relapse was between 26th March and 1st April. The right hand and right arm were chiefly affected, but the left shoulder and arm were also slightly involved. The temperature chart shows a somewhat similar curve to that of the second relapse. The highest temperature registered was 102°·6, on 30th March.

Urine—27th March.—Specific gravity 1020, acid, trace of albumin, no casts found. On 28th March the urine contained about ¼ albumin per mille by Esbach's tube (that is one-fourth of albumin in a thousand parts of urine).

31*st March.*—Specific gravity 1026, acid, moderate cloud of albumin, no sugar. On 1st April the urine was again free from albumin. On 10th April the patient still had slight swelling and tenderness in the hands. The heart then showed nothing abnormal.

The fourth relapse occurred 21st to 25th April. Since the third relapse patient had never been quite free from pains in the shoulder-joints, but on 21st April there was more pain in the joints of his left upper extremity, and the temperature rose to 100°·4 F. in the evening; the urine was of specific gravity 1024, acid, clear, with a moderate cloud of albumin, but no sugar. There was no fever after 28th April.

During the various relapses, salicylate of sodium, lead lotion, aperients, etc., were made use of. On 11th May, when patient left for the Convalescent Home, he looked very well, his heart and lungs showed nothing abnormal, there was no cardiac murmur, and the urine was free from albumin. He complained only of a little pain (on movements, etc.) in the joints of the left upper extremity, and there appeared to be slight puffiness about some of the knuckles of the left hand. His temperature was taken in the Convalescent Home every evening between 18th May and 7th June, and never reached 100° F.

The clinical features of this case were very decided. It is not very rare to see middle-aged persons attacked with an obstinate form of acute or subacute rheumatism, in which the small joints of the feet and hands are often involved, and in which the heart generally escapes. Such cases are, I think, peculiarly liable to relapses, and often prove very resistant to the ordinary methods of treatment. In the present case, however, the peculiar feature was the renal complication, on which salicylate seemed to act beneficially, though, according to some authorities, it might be expected to have a bad effect. The fact that the albuminuria got better on each occasion simultaneously with the improvement in the rheumatic symptoms, forms a strong argument for considering the renal disturbance to be of rheumatic origin. In fact, I believe that in this case the articular symptoms, the pyrexia, and the renal disturbance, which characterised each attack, formed a rheumatic trio, a rheumatic "symptom-complex." In reference, therefore, to the renal symptoms of such cases, the term "rheumatic albuminuria" is, I think, to be preferred to the term "febrile albuminuria."

In cases in which a little albumin is present in the urine, but rapidly disappears after a few doses of calomel or purgatives, or under salicylates, I suspect that a gouty or rheumatic disturbance of the general metabolism is often in great part the cause of the albuminuria, the kidneys themselves being secondarily irritated. In some cases, such as those supposed to be severe "bilious attacks," notably when the specific gravity of the urine is very high owing to excess of urea and urates, the metabolic functions of the liver may be specially at fault.

There are doubtless many other varieties of temporary albuminuria (apart from "physiological albuminuria" or "albuminuria in healthy persons") not due to organic kidney disease, or not necessarily accompanied by such disease. I will, in conclusion, merely allude to what may perhaps be considered a special clinical variety of slight albuminuria, namely, a condition of the urine which may be associated with chronic intestinal catarrh and a tendency to diarrhœa. In this condition the use of subnitrate of bismuth (possibly in large doses), instead of increasing the slight albuminuria by lessening the discharge from the bowels (and thereby, one would ordinarily suppose, throwing more work on the kidneys), may be followed by diminution or disappearance of the albumin from the urine. The explanation is, doubtless, that a favourable effect on the intestinal disorder is obtained, the absorption of irritating products from the intestines is diminished or prevented, and the source of irritation to the kidneys is thus removed.

SOME BRIEF REMARKS ON DYSENTERY AS IT OCCURS IN FIJI.

By CHARLES T. W. HIRSCH, M.R.C.S., L.R.C.P., *Colonial Medical Service, Fiji.*

DYSENTERY is endemic, and occurs among the European settlers, natives, and introduced Indian and Polynesian immigrants; is most prevalent during May, June, and July, that is, in the cool but dry season, when supplies of good drinking water (rain collected in tanks) run short, and recourse is had to ditch or river water.

The mortality varies greatly. Some twelve years ago, when it occurred among Polynesians working on sugar plantations in the Rewa district, over 40 per cent., I believe, succumbed. This is probably to be accounted for by the previous lives and habits of the sufferers—natives of dry, coral, sandy islands, unused to more arduous work than fighting or fishing, and who were unfitted for hard labour in an unopened-up alluvial rainy country, such as Fiji.

In 1894, the mortality from chronic dysentery among Indian immigrants was somewhat high, amounting to 7 per cent. of those attacked with the complaint; the majority of the fatal cases occurred among recently introduced immigrants of poor physique. Acute dysentery among Europeans and Indians almost always runs a favourable course, provided the patients come into hospital and do not indulge in improper and forbidden food, a habit which coolies are unfortunately addicted to. Among the native inhabitants the results are not so good, as there are no hospitals in the out-lying districts for natives, and European medical officers are usually situated too far away to superintend and direct the treatment of such cases in the native towns; and, besides, their other duties would not, as a rule, permit them to do so. The disease is one of the chief causes of mortality among the natives, and an important factor in the decrease, undoubtedly, among them; it is due to impure water and want of proper hygienic surroundings, especially in the towns situated on the low-lying coast-flats in the Tai Levu and Rewa districts.

A certain number of coolies starve themselves in order to save money, and a few may not earn sufficient to feed themselves properly; these are predisposing causes.

Alcohol cannot be a predisposing cause among Fijians or Indians, as in Fiji they are not allowed to indulge in it; with Europeans it is so. Acute dysentery, as already remarked, usually runs a favourable course; is frequently preceded by constipation or diarrhœa; is marked by tormina ventris accompanied by tenesmus, typical dysenteric stools, and occasionally by vomiting. The greater number of cases recover in from seven to fifteen days.

The *treatment* that seemed to answer best was—perfect rest in bed, milk diet, if stomach able to retain; otherwise, raw meat juice, barley, rice-water, sago, arrowroot, or Mellin's food. Stimulants and egg-flips if pulse weak, especially among natives. Hot applications to the abdomen, such as poultice, or fomentations with turpentine if much pain. Ipecacuanha in 20-gr. doses, three times a day. I usually administered ipecacuanha in keratin capsules, which assisted greatly in the retention of the drug.

The treatment of a case is usually best started with castor-oil, 1 oz.; tr. opii, 10 to 20 minims. I rarely administered opium again, though if the ipecacuanha was not retained (which with the keratin capsules was exceptional), I preceded the administration of the drug by tr. opii, 5 to 10 minims. Pomegranate root and other astringents have been used, but have not given such good results as ipecacuanha.

I only made post-mortems in three cases of acute dysentery, and in these ulceration was noted in the cæcum as well as in the transverse and ascending colon; in one case the ulcers were circular, and varied in size from a pea to a shilling; in two cases the ulceration was irregular, probably the result of fusion of a number of circular ones. In one case typical grey gangrenous patches were noticed on the mucosa, though portions of the small gut were congested; in no case did I find ulceration there, nor have I ever found the solitary glands to be greatly enlarged. The mesenteric glands in all three cases were enlarged and congested.

Gangrenous dysentery has occurred in Fiji, in an epidemic form, among Polynesians. Dr. Corney as well as Dr. Daniels have published accounts of such epidemics. In ordinary cases the supervention of gangrene is shown by the extremely offensive odour of the stool, and the fact that necrotic fragments are found in them, also by general symptoms of asthenia.

A fall of temperature below the normal, points to a serious prognosis, though I have known such cases to recover.

Chronic dysentery, in the greater number of cases, starts insidiously as a diarrhœa which one day is well and the next day relapses, and in which mucus and blood are occasionally passed with pain; such cases, unless taken at the very commencement and treated in hospital, are very fatal; even during the intermissions the stools are never healthy, but are light-coloured, fermentative, and offensive, and at other times have the typical odour, and contain blood and mucus. In many cases the appetite is greatly impaired, and craving for improper food is pronounced. Such cases commonly become anæmic, develop œdema of the feet, and die. Dysuria is occasionally complained of.

On post-mortem nearly all the cases show the same signs. Thickening of coats of great gut, with scar of old ulcers in places, and perhaps dilatation above; the peritoneum covering the colon is commonly thickened, and there may be adhesions.

The mucosa is generally greyish, pale, and pigmented in spots. Ulcers are always present, generally serpiginous in form, with indurated edges and thickened bases; the glandular structure is usually atrophied. Liver abscess is a common sequela, and in all old cases of chronic dysentery the liver shows fatty degeneration.

Treatment.—Perfect rest in bed. A change of air is doubtlessly good, but in advanced cases should only be undertaken after mature consideration, as all movement is bad for the patient. Great care should also be taken to prevent chill. Milk diet, if tongue clean and not glazed or raw; in such cases, meat-juice diet, with sago, arrowroot, or Mellin's food. Unless general debility indicates, alcohol (spirits) had better not be given.

In some cases light-boiled eggs and fish may be given, but generally liquid, soft diet is best, on account of the ulceration. Many cases are benefited by the application of a cold compress to the abdomen. Enemata of nitrate of silver (½ drm. to 1½ drms. to 4 oz. or 5 oz. of water, with a little starch in it) give good results in the majority of cases, and one such enema can be given every night for five or six days. Some cases do better with small enemata (about 4 oz.) of luke-warm water with a little antiseptic in it—quinine, boracic, or Condy; in these cases the water may be passed high up the bowel through a soft catheter, introduced with great care through the anus. Internally, ipecacuanha may be tried, but does not seem to have much effect. Bael fruit occasionally has a good effect, so has pomegranate root, and large doses of simaruba. Internal antiseptics, such as salol, have not given satisfaction; nor as a rule do astringents, such as bismuth subnitrate, bismuth salicylate, rhatany catechu, or kino, though in severe diarrhœa they may be employed.

For constipation the mildest laxative should be given, the one I found to answer best is manna.

Accompanying debility and anæmia may, when no acute inflammatory action is going on, be treated with mineral acids, cinchona or iron tonics.

CLINICAL RECORDS.

LARGE URINARY CALCULUS, WHICH WAS IMPACTED IN THE PROSTATIC URETHRA, AND WAS REMOVED BY PERINEAL SECTION.

By GEORGE BUCHANAN, M.A., M.D., LL.D., *Professor of Clinical Surgery in the University of Glasgow.*

Clinical report.—M. H., æt. 32, was admitted to the Western Infirmary, Glasgow, on 6th October 1899. Sixteen months ago felt some difficulty in passing water, with frequent desire to do so—till four months ago these symptoms gradually became aggravated—with a feeling that something was left behind after micturition. The last four months the symptoms became worse, with interruption of the flow of urine and much pain in the hypograstrium and at point of penis—in fact, all the signs of stone in the bladder—although he never noticed blood in the urine, which now frequently trickles away.

On examination, the sound is arrested as it enters the membranous urethra resting against a rough stone which blocks the passage. The finger passed into the rectum discovers the prostate gland enormously enlarged, evidently distended and stretched tightly round a hard irregular body, and so almost blocks up the pubic arch.

Operation.—The calculus was removed by a perineal incision on the lines of the lateral operation of lithotomy. A large grooved staff was passed down the urethra till it rested against the stone just after it had passed through the triangular ligament. The ordinary superficial incision was made from the central point in the perineum obliquely for 4 or 5 inches. The upper part of the wound was deepened by a few applications of the knife, and the groove in the staff felt with the left forefinger. The point of the knife was made to slit open the membranous urethra, and the incision was continued on, dividing the prostate for an inch or more by guiding the knife on the surface of the stone. A strong scoop was now insinuated over the upper surface of the calculus till it reached its posterior end, and was used as a lever to try to dislodge it, but without effect. A lithotomy forceps was now tried, its blades being passed a good way along each side, but the shape of the stone caused it to slip off. The wound in the prostate was now enlarged by notching it nearly half an inch on each side. The forceps now took a firmer grip, and by the use of the scoop levering behind, and the finger in the rectum helping it forward, the stone was removed with very little tearing and no hæmorrhage.

A large indiarubber tube was inserted into the incision up to the opening in the prostate, and secured in position by a stitch to the skin at the depending part of the wound.

The patient progressed favourably to recovery, and is now practically well, sitting up and walking about, although urine comes through the perineum, as is not to be wondered at with such a large cruciform incision in the prostate, but the sinus is daily diminishing—(December 15th).

Remarks.—The stone is unusually large for a urinary calculus occupying the prostatic urethra.

Measurements.—Antero-posterior, 2¼ in.: perpendicular, 1¾ in.; transverse, 1¾ in.

Weight, 1¾ oz.

Composition.—*Nucleus* forming the larger part of the bulk, and protruding at parts through the exterior incrustation, and consisting of oxalate of lime.

The exterior layer, a porous, pumice-stone-looking substance, consisting principally of oxalate of lime with a small admixture of phosphates.

In the operation, which was a little complicated, I was assisted by Dr. Beatson and my son, Dr. G. Burnside Buchanan, my class assistant.

This is the one hundred and eleventh calculus which I have removed by lithotomy or lithotrity.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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Archives of Neurology, from the Pathological Laboratory of the London County Asylums, Claybury, Essex. Edited by FREDERICK WALKER MOTT, F.R.S., M.D., F.R.C.P., Director of the Laboratory and Pathologist to the London County Asylums. London: P. S. King & Son.

WE welcome with genuine satisfaction the appearance of this volume of the "Archives of Neurology," published under the auspices of the London County Council, and emanating from the Pathological Department of the London County Asylums. If these, the first-fruits, betoken the character and quality of future issues, they will be anticipated with keen pleasure by the profession at large.

How far the burden of these Reports has been borne by the shoulders of its distinguished Editor and his colleague, Dr. Wakelin Barratt, is evident from the fact that either alone, or in conjunction with the latter, nearly two-thirds of the letterpress emanates from his pen. Dr. Mott is wholly responsible for seven articles, conjointly for three others, out of a total of twenty-four papers—sufficient vindication of the energy brought to bear upon the new work being done by the Pathological Department of the London County Asylums. The papers are very freely illustrated, a large proportion being photomicrographs; and the type is all that could be desired. A striking feature of the volume now before us is the very special attention bestowed on general paralysis of the insane; and the numerous articles devoted to this subject show how well Dr. Mott has, either by his own investigation, or through his coadjutors, marshalled such facts as could directly or indirectly elucidate the etiology of this terrible protean malady. The volume opens with an elaborate disquisition by Dr. Mott upon the better-known aspects of brain syphilis in hospital and asylum practice. Following upon this is a paper which especially appeals to the student of mental disease.

In a thoughtful and elaborate article on the etiology and pathology of general paralysis, Dr. Mott states the case for syphilis as a factor in the production of this disease. Fully acknowledging the dictum—"No syphilis, no general paralysis"—to be not proven, and candidly admitting certain irreconcilable facts, such as the frequency of syphilis and corresponding rarity of general paralysis in Japan and in Mohammedan countries, he yet arrives at the conclusion that general paralysis is the outcome of stress and syphilis. He tabulates the percentage of syphilis in paralytics furnished by sixty-one authorities (mostly continental), and it will be noted that seven only of these attempt to give the percentage of syphilis *in other psychoses:* in fact, this is the weak link in all such statistical inquiries—*the essential element required for comparison,* namely, the percentage of syphilis for each locality in the community at large, is ignored, and hence to the statistician the result is rather apt to appear but a case of special pleading. Dr. Mott regards tabes and general paralysis as identical diseases affecting different neuron tracts, and alludes to the acknowledged relationships of tabes and syphilis. In explanation of the fact that syphilis plays but a very unimportant rôle in the etiology of general paralysis in certain counties, Dr. Mott, if we correctly appreciate his meaning, assumes a very general syphilisation of such communities through parental sources. Of 118 post-mortems held by him, including thirty-two paralytics, *positive signs of syphilis* were found in about 18 per cent.; but this is no higher than the percentage given by Mendel for syphilis as occurring in "all other psychoses." Further, 33 per cent. afforded "doubtful signs," and 45 per cent. absolutely negative signs. These figures, obtained by such an authority as Dr. Mott, are of the highest importance, and "will give us pause" ere we accept the popular view of the relationships of these two diseases—in our opinion *they do not suffice* to establish the thesis. We quite appreciate Dr. Mott's views of the powerful connection between alcoholic, sexual excess, and general paralysis as affecting predisposed neuropaths; in this connection we believe there will yet be established an etiological significance wholly apart from any specific or autotoxic agency.

It is satisfactory to find his remarks on the weight of the brain in general paralysis fully confirmatory of results obtained at the West Riding Asylum.[1] In forty paralytics, out of 155 cases of insanity examined, the right hemisphere was heavier than the left in 67·5 per cent. The paralytics in 449 cases of insanity at the West Riding Asylum, examined by Dr. Crochley Clapham, gave the average weight of the right as 530 grms., and of the left as 522 grms. Dr. Clapham's tables, however, brought out the fact that for *all cases* of insanity alike (exclusive of general paralysis) the weight was in favour of the right hemisphere—an observation opposed to Dr. Mott's results. The increased arterial pressure in general paralysis stated to exist is strictly in accord with sphygmometric observations and tracings given by ourself in forty cases of this disease.[2] This increased pressure Dr. Mott thinks is not attributable to the agency of choline, which he has demonstrated to be present in the cerebro-spinal fluid in these cases, and which really *lowers the pressure* in the arteries through the medium of the splanchnic area, but to an irritation in the fourth ventricle of which the glial proliferation is the evidence.

In an analysis of twenty-two cases of juvenile general paralysis, Dr. Mott elicits definite signs of congenital syphilis in 59 per cent. He states: "In my opinion there may be many exciting causes, and nearly always the predisposing cause to the disease is hereditary syphilis." In these cases, as in adult subjects of general paralysis, he found the weight of the left hemisphere less than that of the right,—a fact which he correlates with the notable speech defect, the atrophy of tangential fibres and of cortical neurons, especially of frontal and central gyri.

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[1] *West Riding Lun. Asyl. Rep.*, London, 1873 and 1876.

[2] *Journ. Ment. Sc.*, London, 1882, vol. xxvii.

Dr. Hamilton Wright records the examination (by Nissl and Schäfer-Pal methods) of the cortex of the inferior frontal gyri in both hemispheres, in sixteen cases of general paralysis: with few exceptions he finds the tangential belt of fibres absent here on both sides. In association with Dr. Margaret Orange, the same writer gives a careful histological examination of a case of alcoholic polyneuritis, describing the extensive changes occurring in this affection in the ganglion cells of the cortex, peripheral nerves, and muscles. Dr. Wakelin Barratt, in a chemical examination of the cerebral hemispheres of nine cases, including five general paralytics, finds the percentage of water in the brain substance increased in the latter disease, an increase not proportionate to the brain-wasting nor to the age of the subject. The percentage of phosphorus, however, was slightly diminished, *pari passu* with the general wasting, and was always associated with nerve degeneration and chromatolysis. The same features were presented by the spinal cord. Dr. Barratt gives the percentage of water from the normal dried hemisphere as 76·3, and of the phosphorus as 1·47; whilst in general paralysis the proportions were respectively 78·8 to 81·9 per cent., and 1·39 to 1·47 per cent. The wide variations in percentage of phosphorus given by Gutnikov in mental disease, including general paralysis, are therefore not confirmed by Dr. Barratt's observations.

In a further chemical investigation of nerve degeneration by Dr. Mott, in conjunction with Dr. Barratt, it is shown that there is a breaking-up of the phosphorised fats—the lecithin of the myeline by a process of hydration splitting up into glycero-phosphoric acid, stearic acid, and choline; the stearic acid probably uniting with glyceryl radicles to form neutral fats; and, as revealed by Marchi's staining, the axon becomes transformed into fat. Halliburton and Mott had already demonstrated the presence of choline in the cerebro-spinal fluid of paralytics. Two cases of hemiplegia were examined, and the degenerated half of the cord revealed a decided diminution in the percentage of phosphorus.

Dr. Howard Green records the examination of the blood in sixteen cases of general paralysis with the object of estimating the percentage of hæmoglobin, the proportion of white to red corpuscles, and the percentage of the several varieties of leucocytes present. A very definite diminution of hæmoglobin is indicated in most cases. In a further investigation into the etiological relationships of syphilis and general paralysis, Dr. H. W. Lewis gives the ratio of syphilis in general paralysis and in all incoming cases of insanity as 69·5 per cent. and 31 per cent. respectively.

Dr. Barratt in a short article gives the results of a research into the condition of the vagus and sympathetic nerves in general paralysis. The results were purely negative, no degeneration being anywhere discovered—a conclusion not in accordance with that of Dr. Alfred Campbell of Rainhill Asylum,[1] who, together with Colella,[2] had found extensive degeneration of the vagi in twelve cases of general paralysis. Further research in this direction is therefore desirable.

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[1] *Journ. Ment. Sc.*, London, April 1894.

[2] *Ann. di nevrol.*, 1891.

In another article, Dr. Barratt has dealt with the anatomy of the four last cranial nerves, as revealed by serial sections, with the object of identifying the several constituent nerve bundles. It is a record of valuable and laborious work, and will prove of material assistance to both anatomist and pathologist—to the latter especially, in tracing up systems of degenerated fibres. Dr. Mott appends a note on a case of amyotrophic lateral sclerosis, and of an instance of acute poliomyelitis ending fatally in sixteen days. Dr. Lord gives the result of a statistical study of fifty female epileptics at Hanwell Asylum. He indicates that as many as 24 per cent. suffer from coarse lesions of the brain with convulsions; that the death rate from phthisis at Hanwell from 1795 to the present time for this class of patient was 17 per cent. of the total deaths; and that special infirmary accommodation was desirable for a certain section of these. In his tabulated results of oculo-motor reactions, etc., the rarity of pupilary anomalies in epilepsy is well brought out. The isolation and sanatorium system for the phthisical insane are warmly advocated by Dr. Eric France, who appends a table of results afforded by Koch's tuberculin as a test in fifty-five suspected cases of phthisis.

A very important communication emanates from Dr. Herbert E. Durham (Grocer's Research Scholar) on the etiology of the form of colitis prevalent among the insane. A careful bacteriological examination revealed the invariable presence of an extremely minute coccus, cultivated from the blood, spleen, liver, kidney, etc., about half the size of *M. melitensis*. The organism was not proved to be pathogenic for small mammals, nor did his agglutination experiments yield other than negative results; yet he appears to have good reasons for regarding it as the probable origin of asylum colitis.

An exceedingly interesting case of telangiectasis of the left frontal lobe is contributed by Dr. Cecil Beadles, together with a full histological examination of the growth, accompanied by excellent illustrations. So far as we are aware, the first recorded instance of this very rare and unique condition was found by ourself in the brain of a woman at the West Riding Asylum in 1884.[1] The subject was 61 years of age, suffered from acute melancholia, with visual and auditory hallucinations. The mass was as large as a pigeon's egg, situated in the centrum ovale; and microscopical and chemical examination showed it to consist almost entirely of calcified vessels. Unlike the growth in Dr. Beadles' case, it did not encroach upon the cortex, and was unaccompanied by convulsions.

In an interesting inquiry into the causes inducing swelling and chromatolysis of the cortical cell, seen in cases of prolonged epileptiform convulsions, Dr. Mott discusses the question of their relationship to hyperpyrexia (in view of the statements of Goldscheider and Marinesco), and the relationships of such changes to the exhaustion following motor discharges (hyperkinesis). He indicates that since the cornual cells of the cord need not be implicated in these subjects, hyperpyrexia can scarcely be a satisfactory explanation; and that, on the other hand, since such changes occur in hyperpyrexia *without* convulsions, hyperactivity of nerve cell could not be the cause. In one case where 500 unilateral Jacksonian fits had occurred, the motor neurons in either hemisphere were similar in appearance. From these data and considerations of the staining reactions, he concludes that we must attribute the cell changes to altered chemical constitution of surrounding lymph. This article is illustrated by admirable drawings and photomicrographs of preparations stained by Nissl's method.

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[1] Referred to in a note by Dr. Mott at the end of this article, but incorrectly attributed to Dr. Goodhart.

Space forbids more than a mention of the remaining papers by Dr. Tredgold on "Multiple Lesions of the Central Nervous System"; Mr. Redcliffe Salaman on "Tabes with reference to Changes in the Posterior Root Ganglia"; Dr. Mott on "Combined Sclerosis with Grave Anæmia," and, in conjunction with Dr. Hamilton Wright, on "Degeneration of the Posterior Spinal Ganglia and Peripheral Nerves in General Paralysis"—all of which well repay perusal. W. BEVAN LEWIS.

Surgery: A Treatise for Students and Practitioners. By THOMAS PICKERING PICK, Consulting Surgeon to St. George's Hospital. London: Longmans, Green, & Co. 1899.

THIS work is planned on the old familiar lines, and begins with the time-worn description of inflammation, which, according to the author, "is at the root of and underlies most surgical processes." We venture to think that in thus placing inflammation in the forefront of surgery he is giving it a prominence to which it is no longer entitled, and which is not in accordance with the views of modern pathologists. There seems little doubt that much of the confusion which exists in the minds of students on various subjects in surgical pathology, arises from the vague, hesitating, and often inconsistent opinions which surgical writers persistently express as to the nature of the inflammatory process, and its rôle in the economics of surgery. The work before us furnishes us with abundance of illustration. Of course, much depends on our definition of inflammation, but we take the author on his own ground. While he does not clearly state that he rejects the definition given by Burdon Sanderson, he says that, if he does not accept it, "he should regard inflammation as a modification of the normal physiological processes in the various tissues of the body, resulting from the application of some irritant, mechanical, or chemical to the part—or, as Virchow terms it, 'a disorder of nutrition'—the process in many instances being followed by a new material of a less highly organised nature than the original tissue in which the inflammation has taken place."

We find it hard to reconcile the view that in many instances inflammation results in "the formation of new material," with the author's own statement on p. 1, that it "must be regarded as essentially a destructive process"; or this in turn with the further statement on p. 5, that it is "a curative process undertaken to defend the body from some injurious influence which has been brought to bear upon it." And surely it is scarcely consistent to include in the same sentence the statements, "that there is diminished functional activity in inflamed tissues," and that "inflammation is a curative process, undertaken to defend the body," etc. . . . We do not usually expect defensive action to result from diminished activity.

Again, on p. 50, the author declares that he cannot bring himself to believe "that union of wounds is a physiological process, and takes place entirely without the occurrence of any inflammation," after he has already emphasised the fact that inflammation is "essentially a destructive process."

"The strongest argument against the theory" (that repair is a physiological process), he says, "is that the bond of union which unites the severed edges, however brought about, is a more lowly organised material than the original tissue which was injured, showing that there has been retrogression, or impaired vitality, which is the natural result of the inflammatory process." But clearly retrogression or impaired vitality in tissue may result from causes other than inflammation, and if so, then the lowly organisation of the uniting material proves nothing.

The key to the writer's position is evidently found on p. 19, where, in discussing the causes of inflammation, he quotes Mr. Bryant, as representing a school of pathologists who teach that repair and inflammation are not only "not identical, but that they are incompatible. That repair is a *constructive* physiological process . . ., but that inflammation is a *destructive* pathological process, brought about entirely by micro-organisms introduced from without, and that if it attacks a wound in the process of repair, it at first checks this repair and later on brings about disorganising changes; and that when a part repairs, after it has been the seat of inflammation, it does so only when the inflammatory process has been arrested." To this lucid, logical, and convincing proposition the author has no better answer than that there is "abundance of evidence to the contrary," not a scrap of which, however, is vouchsafed to us. We strongly incline to the belief that on no other basis than that enunciated by Mr. Bryant can we arrive at a clear understanding of inflammation from the surgical standpoint, and that so long as we refuse to accept this position our views as to the nature and objects of the process will be as confused and illogical as those we have quoted.

When we come to the author's description of the changes in inflammation we find it clear, concise, and accurate, and leaving little to be desired. We scarcely follow his reasons, however, for throwing such gave doubt on Metchnikoff's theory of phagocytosis, so far as the action of the microphages in destroying bacteria is concerned, when he finds no difficulty in accepting the services of the macrophages in getting rid of the migrated leucocytes after the inflammatory process is over.

In a modern work of nearly twelve hundred pages, we should have expected a more adequate discussion of the general facts of surgical bacteriology than is possible in the space of two pages, which is all the author has devoted to this most important subject. It is true that this meagre description is eked out by additional facts scattered through the volume. For example, the relation of bacteria to oxygen is discussed under "tetanus," but unless the student is already acquainted with the subject it is not in this place that he will look for it, and unfortunately the index gives him no guidance. From the index, too, we miss such references as "toxine" (which the author seems to regard as synonymous with "ptomaine"), "antitoxic sera," "immunity," "diphtheria," "antidiphtheritic serum," and other terms of primary importance in present-day surgery.

The section devoted to "general injuries" is on the whole satisfactory, although we scarcely approve a classification which includes hydrophobia, tetanus, and gun-shot wounds among "injuries affecting soft parts." And this leads us to remark that we are frequently struck with the author's classification of diseases. Thus, in the chapter on suppuration, we find no description of diffuse suppurative cellulitis, but we meet with it forty pages further on under "erysipelas." The description of ulcers does not include the tubercular, the syphilitic, or the perforating ulcer, but this last we find under "diseases of the skin." Again, hectic is defined as "a chronic form of septicæmia," but we have to read other fifty pages before we reach septicæmia. And when we do reach it we find some difficulty in following the author's distinction between it and the other forms of septic poisoning, largely, we fancy, because he fails to discriminate sufficiently between putrefactive and pyogenic processes in wounds.

The chapters on syphilis, tuberculosis, rickets, and certain other general diseases are full of interest, while that on tumours is commendably brief in comparison with many other surgical manuals. Even here, however, the surgeon has encroached unduly on the province of the pathologist, and much of the space devoted to the description of tumour cells might more profitably have been given up to clinical considerations. The illustrations in this section are nearly all diagrammatic, and while they would be excellent as black-board drawings, to illustrate a systematic lecture, they do not reach the standard demanded of a modern text-book—a remark which might be applied to the majority of the illustrations throughout the work.

As we expected, we found the chapters on fractures and dislocations the most satisfactory in the book. The treatment by massage is highly commended, but no mention is made of the ambulant method of treating fractures of the leg, which has proved so useful. Professor Annandale's method of securing fractures by steel pins is fully described and illustrated.

Space forbids us discussing in detail the remainder of this work, but enough has been said to indicate that we are somewhat disappointed with it. By the students of St. George's Hospital, to whom it is dedicated, it will be cherished as embodying the teaching of one who has for many years occupied a prominent position in that school, but we regret we cannot regard it as reflecting the most advanced light of modern surgery.

Alexander Miles.

The Principles and Practice of Medicine. By William Osler, M.D., LL.D., F.R.S., F.R.C.P. Third Edition. Edinburgh and London: Young J. Pentland. 1898.

A work which is almost universally read in two hemispheres, and has passed through two large editions in less than six years, may almost be regarded as having passed through "stress and storm" to a "purer air" in which appreciation alone is possible. So much, however, has been achieved in almost every department of medicine since the last edition appeared, that the author, in keeping his work to the forefront, has found it necessary to make great alterations. It has, in fact, as the title-page states, been largely rewritten, and therefore invites, for that very reason, the criticism of the reader.

The work reflects the wide views and large experience of its author in a higher degree, if possible, than in its earlier editions. Every page is stamped with his powerful individuality and untiring industry. The most recent additions to our knowledge are carefully weighed and conscientiously judged, while almost every subject is illustrated by the author's own observations. The result is, as might be expected, that the book furnishes the most valuable guide for its size that "we English," as Osler has styled the Anglo-Saxons on both sides of the Atlantic, now possess.

Two very important changes have taken place in the arrangement of the work—the inclusion of acute rheumatism and acute pneumonia amongst the specific infectious diseases. For the transference of the former, Osler is led to some extent by the researches of Newsholme on the occurrence of rheumatic epidemics, as well as by the observations of Church on the similarity of its curves of incidence to those of the septic group of diseases. He bases his decision, moreover, upon the mode of onset and clinical features. There can be no doubt that in its tendency to protean manifestations the disease is strikingly like an infection. As regards acute pneumonia, the author is on ground which is absolutely unassailable. The presence of the *Micrococcus lanceolatus* in pericardial and endocardial exudations, as well as in the meninges of the brain, gives pathological evidence of the greatest value, while the definite course of the symptoms yields clinical proof of almost equal importance. It cannot be doubted that the author is wise in making this new departure.

On glancing over the section on the circulation, a slight slip catches the eye. Osler attributes the hypothesis that cyanosis is caused by a mixture of arterial and venous blood to William Hunter. This is a common but groundless belief. That sagacious observer, like the cautious Lowland Scot he was, expressed no view on the subject, as may be seen on reading over the paper in which he is said to have enunciated the opinion. Our author is always so anxious to go to the fountainhead, and so loyal in giving honour to whom honour is due, that he will undoubtedly correct this error in the next edition. The last edition was distinguished by his discovery and recognition of the work of Allan Burns on angina pectoris. We hope the next will clear the memory of William Hunter from the erroneous idea commonly attributed to him.

The section on the nervous system has been entirely rewritten, and is now a masterpiece of terse and lucid exposition. Throughout the work at large an immense amount of new matter has been added. Space forbids a longer article on this admirable volume, which has no equal of its size in any language. Osler thanks his "brethren on both sides of the Atlantic" for their cordial reception of his work, and it is unnecessary to do more than assure him of the warm feelings entertained for him throughout the English-speaking world, and of the hearty appreciation of his labours by all workers in medicine. G. A. GIBSON.

The Pathology of the Emotions. By CH. FÉRÉ. Translated from the French by ROBERT PARK, M.D., Glasgow. London: The University Press Ltd. 1899.

THE task of reviewing a work of this kind is no easy one, for the reason that M. Féré is one of the most original and assiduous living recorders of clinical and experimental phenomena in the domain of neurology. Not only are the pages loaded with his own observations, but they bristle with those of the best known authorities on the various subjects with which he deals. Consequently, the book is not one which it is possible to skim through in an idle hour. There is not always an apparent thread of argument running through the chapters, or an obvious guiding principle upon which one may rest and survey the almost limitless field of detail. The author's conception is, however, apparent in the following extract from the preface:—"If the physiological condition of states of consciousness of central or cerebral origin, and those states of consciousness of peripheral origin, internal or external, are identical, whether in the normal or abnormal state, then the physical agents which are capable of modifying a state of consciousness of peripheral origin are also capable of modifying states of consciousness of central origin; the external signs of those divers states of consciousness can be studied by the same procedures; psychology is only physiology specialised; mental medicine is only a specialisation of general medicine, upon which it ought to impress its procedures of study and procedures of action, all purely physical. It is the demonstration of these relations which is undertaken in this book." With the aim of the author, who in this and his other works has laboured to explain psychical states, normal and pathological, in terms of physiology, every worker in neurology and psychiatry ought to be in full sympathy. It is almost unnecessary to state that M. Féré has treated the subject so elaborately, that, apart from the success or non-success of his object, the work forms an indispensable adjunct to psychiatric literature. One or two points, however, appear to demand criticism. Like most writers of the Spencerian school, the author shows either a wilful disregard of, or a want of acquaintance with, what is opprobriously called metaphysics, and consequently in his desire to avoid the very suspicion of it, he comes to grief. This is exemplified in the continuation of the preceding quotation from the preface—"What we say of emotions can apply to the passions, which are only in fact durable emotions—chronic emotions, if you will." This expression of opinion cannot be explained away; and, if adhered to in its naked crudeness, it must be taken as presuming to offer in the subsequent teaching of the book a physiological explanation of the primary elementary instincts of humanity. The second point of criticism is that the argument is a little overstrained, in so far as it is endeavoured to survey the whole field of mental aberration, from the standpoint of the emotions. The standpoint of the emotions for the study of mental phenomena is undoubtedly a good one, and in the hands of the author of this book it has proved richly instructive; but as it deals entirely with outward symptomatic expression, it is necessarily limited. A perusal of Chap. XIII., on the physical signs of hallucinations, will exemplify the impossibility of satisfactorily studying these phenomena from the varying and uncertain signs of the outward expression of the so-called faculty of attention. But it is manifestly unfair to further criticise in this strain a book written seven years ago, more especially as the author well knows—nay, as he himself has since done much to show—that there are other and more material paths by which psychiatry is rapidly approximating itself to general medicine. The work of translation has been well performed, and the author's meaning is always faithfully reproduced. There is, therefore, all the less excuse for some careless slips, such as the rendering of *alienee* as "alienist" (p. 33); the application of the term "alcoholics" to the beverages of that name (p. 89); and the general use of such uncouth English (?) words as "emotes," "hysterios," or "audial hallucinés."

J. MACPHERSON.

Manuel pratique d'hygiene. Par le DR. GUIRAUD. Second edition.
Paris: G. Steinheil. 1899.

IN this book a wider view of the subject of public health has been taken than is generally done in handbooks of its size in this country. The author claims for hygiene a distinct position among the sciences. He defines it as the study of the reciprocal action, from the health point of view, of man and his environment, and its aim the increasing and strengthening of those external influences that are favourable, and the removal of those that are unfavourable, to healthy living.

The first 150 pages are devoted to a consideration of the soil, the atmosphere, and climate, and very fairly represent the views at present held as to their influence on health. The chapter on climate is particularly good. The physical elements which go to form the different climates, and the physiological action of these on the body, are explained and illustrated in some detail, special attention being given to the therapeutic value of climates at high elevations.

Under potable waters he discusses the chemical and bacteriological characters of water from different sources of supply, as well as the methods of filtration both on the large and small scale. He rightly, we think, maintains that the proof of the causal relation between drinking water and epidemic disease, *e.g.* enteric fever and cholera, is still nearly entirely epidemiological, and that the bacteriological proof, possibly because of the imperfection of our present methods, is still wanting. We thoroughly agree with him that the reaction against the exaggerated importance at first attached to a general bacteriological examination of water may go too far, and that, combined with chemical examination, it may give valuable information as to the purity of a supply. In every case, however, these require to be supplemented by a careful and periodic examination of the source and surroundings of the supply.

A considerable part of the book is given to the subject of alimentation. Here the different food-stuffs, their chemical composition, and more common adulterations, are considered. Though the physiological basis of diet is discussed, this subject is considered rather from the hygienic than the simply physiological point of view. Under beverages the subject of the use of alcohol gets a prominent place, as was indeed to be expected when one considers the great increase in its consumption of late years in France. Any good effects from the use of alcohol he considers therapeutic rather than hygienic. Its evil effects he attributes to the amount consumed rather than to the presence of some of the toxic products of fermentation and distillation. In ordinary *eau de vie* there is only 2 to 5 mgrms. furfurol per litre.

The chapters on school hygiene, diseases connected with industrial occupations, and prophylaxis in epidemic diseases, are carefully written.

The value of this manual we think would have been considerably increased by the addition of one or two chapters on vital statistics.

C. HUNTER STEWART.

A Handbook of Physics and Chemistry. By HERBERT E. CORBIN, B.Sc., and ARCHIBALD M. STEWART, B.Sc. London: J. & A. Churchill. 1899.

IN indicating, in the preface, that this book is designed for students preparing for the examinations of the Conjoint Board, and that it should also be useful to those preparing for pharmaceutical and veterinary examinations, the authors state that it will be necessary for the student to supplement his reading by practical work in the laboratory. With this we readily agree; but there are deficiencies about the book which compel us to assert that the student will also require to supplement his reading by additional reading elsewhere, since the information given upon many subjects is entirely insufficient. In support of this assertion, we instance the omission of any information about the sources of iodine and of bromine. Iodine is said to be prepared from potassium iodide, and when we turn to potassium iodide we find that it is prepared from iodine. The statement about bromine is exactly parallel; and, nevertheless, it is mentioned that both bromide and iodide of potassium are largely used in medicine.

We venture to think that the time-honoured picture of the lecture-table preparation of sulphuric acid, with the accompanying account of the "chamber crystals," might have been displaced, with advantage, by a diagram of a sulphuric-acid chamber, and an account of what goes on in a well-regulated sulphuric-acid works, where "chamber crystals" are never seen. We object to the explanations given of the chemistry of the manufacture of chloroform and of chloral. The former is not known to be correct, and the latter is known to be incorrect. Explanations of this kind are apparently responsible for the idea, widely prevalent amongst examination candidates, that aldehyde can be prepared by the action of chlorine upon alcohol.

LEONARD DOBBIN.

Surgical Shock. By Professor GEORGE W. CRILE of Cleveland, U.S.A. Philadelphia: J. B. Lippincott Co. 1899.

THIS work is based on an experimental research which was awarded the Cartwright Prize for 1897. After a concise historical account of the theories concerning shock, from the time of John Hunter down to the present day, the greater part of the book is taken up with the records of the author's experiments; these, to the number of 148, were performed under anæsthesia on a series of unselected dogs. It is not too much to say of these experiments, that they afford abundant testimony of the ingenuity of the author, and of the scientific accuracy of the methods employed. Every conceivable form of injury or operation, likely to cause shock, was investigated—operations on joints, bones, and nerves; on the brain and medulla; manipulations of the peritoneum, omentum, intestines, kidneys; crushing the testicle; forcible dilatation of the anus, etc., etc. The author's conclusion is, that the phenomena of shock are mainly due to the impairment or breakdown of the vasomotor mechanism, and that the heart is not the principal factor in its production. In practice, the occurrence of shock is influenced by the constitution of the patient, the state of the general health, the duration of the operation, the amount of bruising, tearing, and rough handling of tissues and organs, exposure to cold, the nature of the anæsthesia, the amount of hæmorrhage, and the parts involved by the operation. Important vasomotor areas, such as those of the great splanchnic, are specially susceptible. The concluding chapters deal with the prevention and treatment of shock; the recommendations given are those in general use. Alexis Thomson.

Affections chirurgicales du Tronc. By Professor Polaillon of Paris. Paris: Octave Doin. 1898.

This volume of reported cases and statistics deals with the general diseases and injuries of the trunk, of the spine, thorax, abdomen, and pelvis, and with those of the ano-rectal region and genito-urinary organs. In form and scope it resembles the preceding volume, which was concerned with the surgery of the extremities. In contrast to clinical lectures on selected subjects, the author has collected *all* the cases which have come under his notice as surgeon to the Hôtel Dieu. They constitute a rich mine of clinical observation, and well deserve a place in every surgical library. The absence of any table of contents or index militates against its value as a work of reference. Alexis Thomson.

Enlargement of the Prostate, its Treatment and Radical Cure. By C. Mansell Moullin, Surgeon to the London Hospital. Second Edition. London: H. K. Lewis. 1899.

This book shares with that which preceded it on "Inflammation of the Bladder," a well deserved popularity. The style is attractive and concise, and the author's teaching eminently clinical or practical. The chief interest in any modern work dealing with enlargement of the prostate attaches to the debated questions as to the results of operations on the generative organs, in cases which prove intractable to what has been called "catheter life." The author, whose experience in this matter has been further extended since the appearance of the first edition, holds the view that, while more definite and more brilliant results may be obtained in a few selected cases by prostatectomy, the safer operation, in the majority of cases, is that of double castration. The latter is much more certain and more rapid in its effects than vasectomy, which is only to be regarded as an unsatisfactory substitute. Bottini's method of burning a groove or a channel through the obstructing middle lobe by the galvano-cautery, applied through the urethra, is favourably regarded by the author. At the same time, he believes that it acts less by removing the obstructing tissue than by diminishing or obliterating the congestion of the mucous membrane at the neck of the bladder. Alexis Thomson.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICINE.

UNDER THE CHARGE OF
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THE INFLUENZA HEART.

AMONG the more frequent sequelæ of influenza must be placed, as Saundby (*Birmingh. Med. Rev.*, Nov. 1899) writes, the affections of the heart. These may be organic or functional; the functional appearing in altered rate and rhythm, bradycardia more often than tachycardia, of the heart's action, in many cases inconstant, only occurring under certain conditions, or at certain times. The symptoms frequently simulate those occasioned by abuse of alcohol, tobacco, or tea. The organic lesions are chiefly shown by dilatation of the ventricles, in many cases due to a subacute myocarditis, leading in weak subjects to later fatty degeneration.

Clinically the symptoms most commonly observed in women after an attack of influenza comprise irregularity of the pulse and intermittency, persisting, may be, for months; with pallor, debility, depression; but with no change in the physical signs of the heart. Gastric catarrh is a very common accompaniment. Actual dilatation of the heart is confined in his experience to males, not invariably giving rise to a mitral regurgitant murmur. Albuminuria is rare, dyspepsia common.

The prognosis in these cases is grave, and depends upon environment. Treatment for purely functional disease spells rest, careful dieting, iron, arsenic, and digitalis, if the pulse is rapid. With dilated hearts, patients obtain most good from the Schott mode of treatment, in addition to the measures just detailed.

Sansom (*Internat. Med. Mag.*, Nov. 1899) regards tachycardia as the most frequent cardiac sequel of influenza; many of the cases exhibit quickened action of the heart, but only intermittently. If constant, the patient may suffer little inconvenience, even with a pulse-beat of 120. If intermittent, discomfort arises when the acceleration begins. "Vagus storms" are also common. Palpitation, paroxysmal dyspepsia, nausea, migraine, diarrhœa, dyspnœa, and tachypnœa may occur. In these cases dilatation of the heart is rare, even after prolonged tachycardia; other organic lesions have not been seen. The examples of dilatation seen by Sansom have been chiefly in males. He regards this dilatation as nervous in origin, and sometimes only temporary in character. In one interesting case, a male of alcoholic habits, after an attack of influenza, became dyspnœic, with a pulse of 200, and an extremely dilated heart. In thirteen days the dilatation had disappeared, and the pulse dropped gradually to 56. Probably here there was some alcoholic neuritis of the vagus.

Paroxysmal post-influenzal tachycardia is usually accompanied by several ocular symptoms—(1) Retraction of the upper eyelids toward and under the margins of the orbits; (2) tremor of both lids when gently closed; (3) von Graefe's sign; (4) one eye on a lower level than the other, from unequal muscular balance (Dixon Mann's sign); (5) exophthalmos. These signs are probably due to central causes. Treatment often fails. Digitalis and the like are useless, except in chronic dilatation; in acute dilatation are harmful. If given, it should be intermittently. Simple diet (largely milk), arsenic, and especially weak galvanic currents, passed along the course of the vagi, form the best means of treatment, but it is generally six months or so before marked improvement may take place.

Another condition of the heart seen after influenza is that of irregular action, from slight occasional intermission to "*folie du cœur.*" Gout is the most important associate of irregular heart. The condition is slow of recovery. Physical methods are valuable. Bradycardia, though less common, is more dangerous to life, and usually more distressing. Slowing of the pulse down to 19 beats per minute has been noted. Massage of the limbs is of service here, and in some instances belladonna has acted well; but this condition is even more unsatisfactory for treatment than the quickened or disturbed rhythms.

Cardiac pain after influenza, resembling in severity true angina pectoris, but without high arterial tension, or other circulatory lesion, probably arising from a nervous cause, local or central, was described by Sansom in 1892 and 1894. He now modifies his former description, and admits that in many such, organic heart disease supervenes. Post-mortem examinations of several cases, with previous history of such attacks, afforded signs of aortitis—acute, subacute, or chronic, localised or general. The acute cases are little influenced by treatment. In the others, temporary relief of the symptoms should follow long-continued administration of iodides, in 5- to 10-gr. doses.

LOBAR PNEUMONIA AFTER INFLUENZA EPIDEMICS.

IN an editorial in the *Indian Med. Gaz.*, Calcutta, September 1899, the characters of lobar pneumonia, as encountered since the date of the first great pandemic of the latest influenzal cycle, that is, since 1889, are alluded to.

During the years which have elapsed since the first reappearance of influenza in pandemic form, lobar pneumonias have failed in very many instances to conform to official and orthodox descriptions. In India the duration of cases of this class is usually longer than seven or eight days; the crises are indefinite; pleuritis common, without causing much pain; the mortality equal to that formerly observed among British troops in India, 16 per cent.

King (*Med. News*, Phila., 8th July 1899), on the other hand, regards pleurisy as extremely rare in cases of lobar pneumonia caused by the bacillus of influenza alone (he records a case in which the sputum showed no pneumonococci, and very few other forms, save Pfeiffer's bacillus, the last in abundance). While such cases are of shorter duration, they show excessive vasomotor and central disturbance, terminate otherwise than by crisis, and of themselves are seldom fatal, but predispose to other forms of infection of the lung. Muir and Ritchie in their "Manual of Bacteriology" (2nd edition) point out that the prevalent type of acute pneumonia is frequently a combination of catarrhal and croupous conditions in the same lung.

Paltauf (*Wien. klin. Wchnschr.*, 1899, No. 21) gives details of a number of pulmonary cases in which the influenza bacillus was proved to be present. In sixteen cases of lobar pneumonia it occurred—ten of the right lung, three of the left, two of both lungs, and one with gangrene, side not stated. The actual conditions present were identical with typical lobar pneumonia, but in all a suppurative bronchitis was also found.

APPENDICITIS AND INFLUENZA.

GAGNIÈRE (*Gaz. d. hôp.*, Paris, 7th Nov. 1899) observed eleven cases of appendicitis during the prevalence of an influenza epidemic in the first four months of the present year, in seven of which the two diseases were coexistent. Two of the eleven were operated on, both with a fatal result.

THE TONGUE IN INFLUENZA.

D'HOTEL (*Journ. de méd. interne*, Paris, 1st May 1899) finds that the tongue, one day or two days after invasion by influenza, is coated with a white, opalescent fur, covering its centre. It is the last symptom to disappear, and as long as it remains, even if only as a whitish triangle at the base, the disease has not run its full course. Still more important, however, is the fact that this white fur is strongly acid in reaction to litmus. Arguing from this, D'Hotel concluded that alkalies are the drugs indicated in influenza, and, practising by his precept, reports much success.

SURGERY.

UNDER THE CHARGE OF

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THE SURGICAL TREATMENT OF DILATED STOMACH.

JONNESCO of Bucharest reported on this subject to the recent Congress of French Surgeons. He specially referred to cases in which the dilatation of the stomach was accompanied by prolapse or ptosis of the organ, and by intense chronic gastritis. He recommended an operation which combined gastro-enterostomy with gastrorraphy and gastropexy, and carried it out successfully in the following case:—A man, æt. 30, had suffered for three years from severe pain and sensation of burning in the epigastrium after food; there was no vomiting; emaciation was progressive; medical treatment had failed to give him relief. The stomach was distended, and was displaced downwards below the umbilicus.

The following operation was performed on the 24th May 1899:—Median incision above the umbilicus—the dilated and displaced stomach did not present any pyloric lesion; anterior gastrorraphy—the greater curvature was secured to the lesser by a series of nine catgut sutures, whereby the stomach was made to assume an almost cylindrical form; the ends of the sutures were left long, to be used in the gastropexy at a later stage in the operation. A posterior gastro-enterostomy, across the mesocolon, was then carried out, catgut sutures being again employed; the two limbs of the loop of jejunum concerned were made to communicate with each other to prevent the regurgitation of intestinal contents into the stomach (jejuno-jejunostomy). Finally, the stomach was raised and secured in its normal position by passing the ends of the sutures (which had been left long after completing the gastrorraphy) through the parietal peritoneum and subjacent tissues on the deep surface of the ribs on the left side (gastropexy). The pylorus lay immediately underneath the liver. In spite of a temporary congestion of the lungs, the patient made a good recovery; nourishment was given by the rectum for three days, milk by the mouth for four days, subsequently ordinary diet. Everything was easily digested without pain. The patient gained weight rapidly. The gastric contents were found to be quite normal and free from bile.—*Rev. de chir.*, Paris, November 1899.

THE ADDITION OF A TEMPORARY GASTROSTOMY IN GASTRO-ENTEROSTOMY.

Rutkowski of Krakow proposes the above, with the object of lowering the mortality in gastro-enterostomy. Von Hacker's and Wölfler's first method, while placing comparatively little strain on the vitality of the patient, does not provide any guarantee that the contents of the intestine will not regurgitate into the stomach; this regurgitation is generally regarded as a serious hindrance to the patient's recovery. The method of Roux of Lausanne, and Wölfler's second method, on the other hand, while preventing regurgitation, are severe operations, considering the reduced condition of the patients requiring gastro-enterostomy. The author also maintains that none of the methods hitherto practised permit of the nourishment of the patient immediately after operation. His method is as follows:—He first performs a simple anterior gastro-enterostomy; a few centimetres above the site of anastomosis, between the stomach and intestine, he makes a small opening into the stomach; through the latter a fine drainage tube is passed into the stomach, through the anastomotic opening, and finally into the efferent loop of the jejunum; the stomach is then stitched around the drainage tube after Witzel's method; the tube is removed in ten days, and the track of the tube heals in about a week. This additional gastrostomy does not take more than five minutes, and does not add to the severity of the operation. The gastric contents find an easy passage into the intestine around the drainage tube; the latter also maintains the efferent limb of the jejunal loop in good position, and prevents any kinking of the intestine or the formation of a spur. The patient may be nourished at a very early stage, as in a Witzel's gastrostomy.

The author has practised the operation upon three occasions, two cases of cancer and one of ulcer of the stomach, all of which made an uneventful recovery. — *Centralbl. f. Chir.*, Leipzig, 30th September 1899.

INTESTINAL OBSTRUCTION FROM VOLVULUS OF THE SMALL INTESTINE.

Bérard and Delorc of Lyons have observed six cases of intestinal obstruction from this cause in adults. The ileum was concerned in all of them: in one case nearly the whole ileum was involved; in four, coils in the vicinity of the cæcum, varying in length from 40 to 90 cms.; in the remaining case, the cæcum, which was provided with a mesentery, was twisted along with the ileum. The only recognisable predisposing factor was the elongation of the mesentery, resulting from the long-standing engagement of a loop of bowel in an old hernia. The twisted bowel presents a groove of strangulation at either extremity. Its walls, as well as the mesentery, are infiltrated with blood, as a result of the interference with the venous return; the damage sustained by the mucous membrane of the intestine favours bacterial infection from the contents of the latter. The majority of the cases were operated upon four or six days after the onset of the volvulus, by which time there was advanced peritonitis. The clinical features were those of acute obstruction, with violent pain and general illness; the vomiting not abundant, the obstruction not always complete. From the rapid distension of the belly, it was impossible to localise the lesion before operation, except in so far as the maximum distension being around the umbilicus, indicated involvement of the ileum. Recovery is hopeless without operation; simple enterotomy is useless; even where it is possible to undo the volvulus, one may require to resect the strangulated bowel to a greater or lesser extent. Among the cases here recorded, the volvulus was recognised and reduced in four of them, one requiring the resection of 70 cms. of bowel. Only one recovered. In the remaining two, the nature of the lesion was overlooked at the operation, and was only discovered after death. The very high mortality is to be ascribed to the rapid onset of septic peritonitis and the delay in having recourse to operative interference. — Congress of French Surgeons, *Rev. de chir.*, Paris, November 1899.

THE OCCURRENCE OF FISTULA AFTER OPERATIONS FOR APPENDICITIS.

In a total of 441 cases of appendicitis treated in Sonnenberg's clinique, Mühsam has collected the records of seventy-four in which the operation was followed by a fistula. Those which discharged serum or pus, twenty-five in number, were associated either with the persistence of ligature material, or with communication with the appendix; the latter may arise from its imperfect closure by suture after removing it, or in cases in which the appendix cannot be found. Fifteen of these fistulæ healed spontaneously; the remaining ten were cured by an operation, which consisted in opening up the fistula, removing the stump of the appendix, or suturing the aperture in the cæcum. The more important fæcal fistulæ, to the number of forty-nine, may originate in the same way as the preceding, or from injury of the bowel during the operation, or from destruction of its wall by suppuration and necrosis. Thirty-one of these either closed spontaneously or improved so mnch that there was no call for interference. Twelve died, including three in which the fistula was closed by operation; the causes of death were peritonitis, tuberculosis, secondary hæmorrhage, and intestinal obstructions from kinking of the bowel.—*Mitt. a. d. Grenzgeb. d. Med. u. chir.*, Jena, Bd. v., Heft 1.

ACUTE DIFFUSE GONOCOCCUS PERITONITIS.

CUSHING of Baltimore refers to the uncertainty which exists as to the cause of peritonitis which may develop during the course of gonorrhœa, namely, whether it is due to the gonococcus or to a mixed infection. He records two cases of general peritonitis in which the most careful observation failed to find any other organism than the gonococcus. The patients were females suffering from chronic gonorrhœa; the peritonitis developed during menstruation. Cure was brought about by laparotomy in both cases.—*Johns Hopkins Hosp. Bull.*, Baltimore, May 1899.

A NEW METHOD OF EXCISING THE ELBOW-JOINT.

DR. TITO CAVAZZANI of Pavia recommends the following operation as being more rapid in execution, and as inflicting less injury to the soft parts around the joint, than the methods in general use. The incision is a horizontal one over the interarticular interval, upon the external aspect of the joint. It is made through the skin and subcutaneous cellular tissue, beginning at the outer side of the tendon of the biceps, 2 cms. below the external epicondyle, and runs horizontally outwards in the interval between the humerus and the radius; on reaching the posterior aspect of the limb, it inclines obliquely upwards and terminates near the tip of the olecranon process of the ulna. The next step in the operation is to clear the external epicondyle, by dividing the deep fascia longitudinally and separating the attachments of muscles subperiosteally, exposing the capsule of the joint inwards, as far as the coronoid process, and backwards as far as the olecranon. The outer part of the tendon of the triceps is then detached, in continuity with the periosteum of the ulna, exposing the radial aspect and tip of the olecranon. The capsular and external lateral ligaments of the joint are divided along the interval between the bones, from the coronoid in front to the olecranon behind; one is then able to dislocate the bones of the forearm so that the ulnar border of the hand comes into contact with the axilla. When the operation is completed and the bones are replaced, the divided structures are brought together by sutures.

Neither the nerves nor the vessels are exposed to injury; the triceps tendon is only partly divided. Passive movements are commenced in eight or ten days, by which time the wound should be healed.—*Centralbl. f. Chir.*, Leipzig, 21st October 1899.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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CHOREA GRAVIDARUM.

BACKHAUS reports a fatal case of chorea occurring during pregnancy in the Leipzig Maternity Hospital. The patient, æt. 21, had never had rheumatism or heart disease. On admission she was in the ninth month of pregnancy. When about six months pregnant she observed twitchings in the shoulders and arms, aggravated by exertion, which gradually became more severe, and finally developed into typical chorea. The right side was especially affected, speech indistinct, the patient easily excited, and the cardiac dulness increased. It was decided to terminate the pregnancy, and the fœtus was extracted after version.

The choreic movements persisted after delivery, and two days later she became comatose, and died with symptoms of exhaustion. The post-mortem revealed hyperæmia of the pia mater, acute endocarditis, slight dilatation of the ventricles, and broncho-pneumonia, especially marked in the lower lobes.

In Donat's case, the patient, æt. 25, was pregnant four months, and complained of progressive muscular twitchings which had come on ten days before admission. Her previous pregnancies had been uneventful, but three weeks after her confinement she had slight twitchings while nursing the child, which ceased when lactation was discontinued. Absolute rest was ordered, with potassium bromide and Fowler's solution. As the symptoms persisted, the woman becoming exhausted and developing subcutaneous hæmorrhages all over the body, it was decided to terminate the pregnancy. The cervix was dilated, and whenever labour pains began the convulsions ceased, and the patient rapidly improved, slight twitchings only remaining for six weeks. Sanger, in discussing the subject, says that there is a marked difference between the benign form of chorea, corresponding to that of childhood, and the malignant variety, which is always complicated by diseases of the brain, heart, and kidneys. The former, probably being reflex, disappears after emptying the uterus, while the latter is unaffected.—*Centralbl. f. Gynäk.*, Leipzig, 1899, No. 16.

POST-PARTUM REPAIR OF LACERATIONS OF THE CERVIX UTERI.

DR. CUSHING in his article calls attention to the great frequency with which the cervix uteri is torn during childbirth, and to the necessity of repairing such lacerations without delay. He points out that lacerations which are allowed to heal by granulation result in the formation of scar tissue, causing hypertrophy, hyperæsthesia, disturbed function, and troublesome reflex symptoms. He also points out that many are of opinion that such unhealed lacerations are a common exciting cause of cancer of the cervix. He advocates a routine examination of every patient after delivery, and that as the parts are so overstretched, bruised, and swollen, digital examination is not sufficient, but that a Sims' speculum should be used, all blood clots and débris wiped away, and a thoróugh examination of the cervix made. If the cervix is found to be torn, it should at once be repaired with interrupted sutures of formalin catgut.—*Am. Journ. Obst.*, N. Y., Nov. 1899.

CONCEALED MENSTRUATION.

A. **BROTHERS** describes the case of a patient who complained of the following symptoms. Every four weeks she thinks she is going to menstruate. She suffers pelvic pain so severe as to confine her to her bed for three days, but there is no trace of menstrual blood. After the third day she feels perfectly well, and remains so for four weeks. This cycle of events has recurred for five months. On examination, the uterus was found anteflexed and pushed forward by a cystic tumour of considerable size in the pouch of Douglas. The patient was anæsthetised, the posterior vaginal wall incised, and the cyst punctured, when 6 to 8 oz. of unclotted, dark, tarry blood were drawn off. Further examination revealed extensive adhesions, and a second tumour high up on the right side. The abdomen was opened, and the second tumour freed from above. It ruptured, and about a pint of tarry fluid escaped into the abdominal cavity, which was washed out and the wound closed. The patient developed acute nephritis and pleuro-pneumonia, but eventually recovered, and has remained well for eight months. Both specimens were ovarian sacs, in which the parenchyma was absent, and each communicated by an artificial opening with the corresponding Fallopian tube. The tubes were not much enlarged, but at their outer ends were flattened and adherent to the ovarian sacs, and the openings at their fimbriated extremities were obliterated. The author considers this a case of primary menstruation into the ovaries.—*Med. Rec.*, N. Y., August 1899.

THE FREQUENCY OF PELVIC DISORDERS IN INSANE WOMEN.

DR. MANTON has for the last ten years made a routine practice of examining into the pelvic condition of patients resident in the Eastern Michigan Asylum. He maintains that pelvic disease is as liable to occur in insane persons as in sane, and that the absence of information as to its existence is often because no attempt has been made to discover it, and also that the results of treatment go to prove that there is an intimate relation existing between the female generative organs and the seat of the mind. While many of these women have delusions referable to the sexual organs when the latter are perfectly healthy, at the same time others are keenly aware as to the source of their discomfort, and in the case of those who are unable to give a coherent description of the symptoms, an observant female attendant may often discover sufficient to merit her calling the physician's attention to her patient's condition.

Dr. Manton, for the sake of illustration, publishes the result of examination in the last hundred consecutive cases, in which he found eighty-one suffering from some pathological condition of the sexual organs, and proceeds to classify them.—*Am. Journ. Obst.*, N. Y., Jan. 1899.

PAROTID GLAND EXTRACT IN THE TREATMENT OF OVARIAN DISEASE.

E. P. MELLETT finds that parotid gland extract relieves the pain of dysmenorrhoea in all cases, whatever pathological condition is present, more than any other so-called uterine sedative. It relieves the dull aching pains referred to the back and ovarian regions. Menstruation when deranged becomes more regular, less in quantity, and of shorter duration. Pelvic exudations seem to soften, and become absorbed more rapidly under abdomino-pelvic massage when this preparation is administered. In cases of artificial climacteric, however, the flashes of heat and cold complained of were distinctly aggravated.—*New York Med. Journ.*, August 23, 1899.

A NEW METHOD OF INDUCTION OF PREMATURE LABOUR.

SPINELI describes the following method of inducing premature labour. The rectum and bladder being emptied, and the external genitals, vagina, and cervical canal thoroughly disinfected, a speculum is introduced, and the cervix drawn forward by tenaculum forceps grasping the posterior lip of the cervix. If the finger cannot be introduced into the cervix it is dilated with a metal dilator, when the index finger is inserted and the membranes separated as far as possible. A long strip of sterilised gauze, soaked in ichthyol, is then introduced with the guidance of the finger into the lower pole of the uterus, and packed as firmly as possible between the membranes and the uterine wall, and the vagina packed with gauze. A T bandage is then applied, and the patient remains in the recumbent posture. Pains are soon induced and the expulsion of the vaginal and uterine tampon give evidence of the progress of the labour.—*Frauenarzt*, Berlin, 1899, No. 7.

THERAPEUTICS.

UNDER THE CHARGE OF

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TREATMENT OF SCIATICA.

EULENBERG has published a long paper on this subject (*Therap. d. Gegenw.*, Berlin u. Wien, 1899). The cause of the neuralgia may depend on a neuroma, or other local tumours inside or outside the pelvis, and these demand surgical measures. In numerous cases it depends on distension of the abdominal veins, and here a vegetable diet and local blood-letting are indicated (leeches to anus, and over sciatic nerve), with habitual use of a purgative mineral water, or a course of spa treatment. When severe constipation is the cause, it must be energetically treated by the usual methods. Sciatica sometimes occurs as a consequence of gonorrhœa, syphilis, gout, diabetes, alcoholic, lead, and mercury poisoning, and then general as well as local treatment must be resorted to. In ordinary cases, recent and with severe pain, rest in bed is necessary, with warm applications and the local injection of a 2 per cent. solution carbolic acid, or of morphine. In specially painful cases, cocaine may be injected. The injections should be made deeply, so as to reach the more superficial branches at least of the nerve. The faradic current applied to the painful places and along the nerve temporarily abolishes the pain in most cases. The galvanic current has a more lasting and curative effect. The positive electrode should be a large plate of lead applied over the exit of the sacral plexus and the sacrum; the negative electrode can be applied to the sole of the foot, or at some other point. Five to seven milliampères should be applied for ten minutes or longer at a time. Massage should be used only when the acutely painful stage is past. Rubbing and kneading along the nerve should be practised. Nerve stretching should be practised by bending the stiffly extended leg over the abdomen. In obstinate cases, hot baths, packs, sprays, hot air douches, etc., frequently bring about a cure. Nerve stretching by the surgeon has proved of little value, and the same is true of iodides, bromides, arsenic, etc.

ARSENIC AND IODOTHYRIN.

EWALD, on the recommendation of Mabille (Reims), has given arsenic along with thyroid preparations, to prevent the occurrence of the well-known untoward effects which are sometimes produced by the latter. He gave iodothyrin tablets in five cases of goitre, one of corpulence, and one of myxœdema, along with small doses of Fowler's solution. The curative thyroid action was manifested, but none of the poisonous symptoms, although he fully expected them to occur after the large doses given.—*Therap. d. Gegenw.*, Berlin u. Wien, 1899.

TREATMENT OF LOCOMOTOR ATAXIA.

HIRSCHKRON, after reviewing the causation and symptoms of tabes dorsalis, gives general directions for its treatment. He regards syphilis as its fundamental cause, and holds that all other alleged causes are simply accessory. The syphilitic toxins remain for years in the body, and are capable of inducing changes in many organs and tissues, and hence locomotor ataxia is a general disease as well as a disease of the spinal cord. This also explains why antisyphilitic treatment is of so little value, since mercury and iodine can cause gummatous new growths to disappear, but have no control over the deleterious influences of chemical toxins. A thorough antisyphilitic course of treatment at the time of infection prevents the occurrence of locomotor ataxia in most cases, but after insufficient treatment and in presence of exciting causes (cold, heredity, fatigue, sexual excesses) it is apt to occur in syphilitics. Mercury and iodine should only be given in tabes dorsalis, if the patient has very recently had syphilis or shows active symptoms of it, or has cerebral symptoms, or has never been properly treated. They are contra-indicated in old cases, with cachectic symptoms, and in persons susceptible to iodine or mercury poisoning. Prompt treatment at the time of infection is undoubtedly prophylactic. It is very chronic, and for long, neuralgic pains may be the chief or only symptom. When the diagnosis has been made, Erb's advice as to treatment is that the patient should live as if he were an old man, quietly, regularly, and with no excitements. To lessen the pains, antifebrin and phenacetin are most useful. The former is given in 3- to 4-gr. doses, one with wine at the beginning (to dissolve it up and hasten its absorption), and a second five or ten minutes later. Phenacetin is given to twice this dose. Two or three times a day is sufficiently often to give either. A mixture of antipyrin, caffeine, and cocaine also does well sometimes. Seven grs. of quinine sulphate occasionally has a satisfactory effect. Cannabis indica may also be tried. If these fail, chloral hydrate or a hot bath, and finally morphine, may be administered. As the pains lessen again in severity, recourse may be had to the milder measures. Cold and wet are the most common exciting causes of severe pains. A slight feverish attack often brings them on and makes them very severe. Of external remedies, ichthyol is the best in 30 per cent. ointment, and its action is increased by hot applications. Tightly applied flannel bandages from the toes up, or round the body, lessen leg and girdle pain.

Hydrotherapeutic measures are valuable, but require caution. Too many baths and at too high a temperature must be avoided—about 82° F., and from five to twenty minutes' duration. In the early stages simple warm baths are best, but later, when there is anæsthesia, muscular weakness, and torpor, carbonic acid and moor baths are more stimulating. Packs, sitz- and foot-baths, douches, and often hot air, are hurtful, and increase the lightning pains. The value of electrical treatment is apt to be overestimated. The application of the constant current to the spinal cord (anode at neck, cathode at sacrum) or to the sympathetic, gives a subjective feeling of well-being, but does not effect permanent good. The faradic current is much more useful, and in anæsthesia and paræsthesia its persevering local application often produces lasting benefit. Treatment by suspension is of no value, and often does harm.

Systematic exercises in co-ordination of movement have proved of great use. They are carried out regularly for the legs and arms, and improve the co-ordinating power while giving exercise. The patient should not be allowed to tire himself, and they are contra-indicated if any of the severe complications be present. For counter-irritation extreme measures should be avoided, iodine and the faradic current accomplishing all the improvement which can be attained in this way. Massage and gymnastic exercises do little good, and may induce fatigue and pains. The joint affections require rest and support, sometimes rubbing and passive movements. Optic atrophy is beyond the power of treatment. The constipation should be obviated by diet and abdominal massage, but enemata do best on the whole; bladder troubles may be treated with ergot, and less usefully with electricity or strychnine. Pressure over the viscus often empties it.

In gastric crises, absolute rest in bed is necessary. Food by the mouth may require to be absolutely withheld, but it should be given liberally by the rectum; warm baths, and the galvanic or faradic current applied directly to the stomach, often improve matters. Bromide and morphine should be given. When the larynx or genital organs are affected with crises, warm baths, antifebrin, painting with cocaine, inhalation of chloroform, may do good. Most of the internal remedies generally recommended are worthless.

Tabetic symptoms are sometimes seen in exophthalmic goitre, alcoholism, hysteria, and after influenza and diphtheria, but these disappear, and the prognosis is always good.—*Centralbl. f. d. ges. Therap.*, Wien, November 1899.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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SUBPHRENIC ABSCESS.

CASES illustrative of this condition continue to appear at intervals in various journals, and it may be doubted if the profession in general is yet sufficiently alert in the recognition thereof. The early recognition of the presence of this morbid state is of great importance, and this is not likely to be accomplished without a thorough grasp of the various pathological factors which tend to its production. The three following cases will serve to illustrate this. The first is published by Finley (*Montreal Med. Journ.*, October 1899, p. 759) under the title of "Pneumothorax from Gas-producing Bacteria." It is of one of those cases of double-barrelled interest, which, although primarily a case of subphrenic abscess, came in the course of its progress to show this secondary pathological condition, which induced the author to give this title to the paper. He first mentions the views of Senator, Welch, and others as to the production of gas in the pleural cavity and living tissues. Welch discovered the *Bacillus capsulatus ærogenes* in such productions, and Finley attributes his case to the *B. coli communis*. The particulars of the case are shortly as follows:—J. W., æt. 46, was admitted to the Montreal Hospital on 26th December 1898, suffering from sudden, severe pain in the abdomen. Appendicitis was first feared, but nearly a month later signs of mischief appeared near the base of the right lung, and aspiration here drew off some clear serous fluid. His appearance at this time was suggestive of some severe illness. He was prostrate and feverish, with laboured and rapid respiration and a quick pulse. There was distinct fulness over the right side of the thorax, an area of dulness at the right base, which was higher in the middle than at either side, and the breath sounds over this area were very feeble. Anteriorly from the costal margin to the fifth rib, there was hyper-resonance and the metallic coin sound, and, in addition, distinct succussion proved that both air and fluid were present in the pleural cavity. On 28th Jan. an aspirating needle was introduced in the eighth space posteriorly, and 20 per cent. of almost pure blood drawn off, which coagulated immediately. The further progress of the case was progressively downwards. The prostration increased, the temperature ranged from 100° to 102°, the pulse became rapid and weak, and death took place from exhaustion on 4th Feb. The post-mortem revealed dense adhesions between the upper surface of the right lobe of the liver and the diaphragm. On pouring water over the pectoral muscles, near the axillary line, a few bubbles of gas escaped on piercing the chest wall. The right pleura was adherent, the adhesions below being ¼ in. thick. There was a thick-walled sac in the pleura, posteriorly containing fœtid pus, which was found to communicate by an opening admitting a finger, with a space between the right lobe of the liver and the diaphragm. This space contained pus similar to that in the pleural sac. There was no communication between either cavity and any air-containing viscus, either lung or bowel. The abdominal organs were healthy. Bacteriological examination of the pus showed a mixed culture of principally the *B. coli* and *Proteus*. The physicians diagnosed a localised pneumothorax during life, but were at a loss to account for it, as there was no evidence of tubercle of the lungs. The possibility of a pyopneumothorax subphrenicus was considered, but thought to be unlikely from there being no downward displacement of the liver, and from the heart being somewhat displaced to the right, which is not believed to prevail in effusions below the diaphragm. The autopsy showed that this was apparently the primary condition, but it did not disclose the origin of the subphrenic abscess itself. The author does not comment on this, being apparently chiefly interested in explaining the production of gas. He accepts the subphrenic abscess, and reasons that it was probably infected from the intestine by the *B. coli*. He gives particulars of other three cases of pneumothorax, in one of which (May and Gebhard) the cause was also the *B. coli*, and in the other two (those of Levy and Nicholls) it was due to the *B. capsulatus ærogenes*. Other cases might have been cited, *e.g.* Leith's (*Edin. Hosp. Rep.*, 1895, p. 323), where a large capsule's coccus was found, so that Finley's conclusions may be accepted—(1) That pneumothorax may, in exceptional cases, result from gas-producing bacteria, and that the *B. coli* or *B. capsulatus ærogenes* may be the organism concerned; (2) that the presence of hydrogen or other gases not found in the atmosphere is conclusive proof of this condition being induced by gas-producing bacteria. His paper would have added something to its value, if he had thoroughly thrashed out the possible sources of the primary infection which had produced the subphrenic abscess. The next case was of a more satisfactory nature in this respect, although it does not appear that the abdominal character of the early symptoms received sufficient attention. It is recorded by Cruice (*Proc. Path. Soc. Phila.*, 1st July 1899, p. 243). J. P., æt. 25, was admitted to the Philadelphia Hospital on 21st April, complaining of pain and tenderness in the epigastrium. He stated that three weeks previous to his admission, he had had an attack of colic. The next day he had an attack of excruciating pain in the epigastrium, which caused him to fall on the floor. It radiated upwards for a few minutes, but was afterwards confined to the epigastrium. He had previously been constipated, but now his bowels were loose. There was no jaundice. On admission, his abdomen was scaphoid in shape. The recti were rigid. There was a prominence in the epigastrium, which was very tender to the touch, but did not move with respiration. The right lung showed flatness for about 1 in. below the scapula posteriorly, and from about the fifth interspace in the axillary line down to the base. Breath sounds were absent here. Above this area, up to about the angle of the scapula, there was a tympanitic note, bronchial breathing, bronchophony, and pectoriloquy. The liver dulness in front was continuous with the epigastric fulness, extending down to about 1½ in. above the umbilicus. There was tenderness over the whole liver. Three days after, he had a violent and long protracted attack of coughing, and expectorated large amounts of yellow vile-smelling pus. This showed diplococci and a bacillus resembling the colon bacillus. He tried to drain the pus cavity by lying down twice a day, and allowing as much pus as would to run out, but this only gave him temporary relief. A succussive splash could then be obtained. The temperature ranged from normal to 103°. An empyema was suspected, and an incision made on the 19th into the chest, at the level of the sixth and seventh ribs in the axillary line. A quart or two of thin, greenish, fæcal-smelling pus was evacuated. He continued to fail, and died on the 3rd of May. At the post-mortem the omentum was found well stretched over the intestines, and firmly adherent to the sides of the abdomen. There was an extensive pelvic peritonitis. The appendix was bound down for almost its entire length to the cæcum and outer surface of the ascending colon, the tip being free for about 1 in. Upon separating the appendix from its adhesions, a small abscess cavity was found, and a small perforation in the appendix communicating therewith. There was another abscess at the junction of the right and left lobes of the liver, bounded posteriorly by the liver and anterior abdominal wall, and communicating by a short sinus through the suspensory ligament with another abscess, bounded by the left lobe of the liver above and the lesser curvature of the stomach below. Between the right lobe of the liver and the diaphragm there was another abscess, about as large as a fœtal head. The inner and lower walls of the abscess were formed by the right lobe of the liver, and the outer and upper walls by the diaphragm. On blowing air into the right bronchus, air was seen to escape from the diaphragmatic surface of the abscess by four openings. The right lung was pushed upwards, so that its lower boundary was at the fifth interspace, and it was "gangrenous" in appearance for a small part of its anterior margin, but not "gangrenous" in odour. In the middle of the lower lobe there was a large cavernous cavity. The left lung showed patches of greyish consolidation and one small "gangrenous" patch. Bacteriological examination showed that cultures from the abscess in right lung contained streptococci and a few diplococci. Cultures from the abscess about the appendix showed the colon bacillus, and so did those from the abscess between the right and left lobes of the liver. The course in this case is sufficiently clear, and it ought to be carefully borne in mind, as it is of occasional occurrence. In all cases of puzzling inflammatory thoracic affections, the onset in symptoms referable to the abdomen ought never to be lost sight of, and ought to suggest an infra-diaphragmatic origin, even in cases less clear than this. Here the appendicular abscess gave rise to the pelvic peritonitis, and also to the subphrenic and neighbouring abscesses, and the former soon came to perforate the diaphragm, and the lung becoming adherent thereto was in turn perforated, and the abscesses came to discharge themselves through the bronchi. The gas present in this case obtained entrance by the bronchi, and was probably not produced by the *B. coli*, although that organism was present. The third case, that of Canthiex (*Brit. Med. Journ.*, London, September 1899), is selected on account of its pathological imperfections. Whatever interest and merit it may have clinically, it lacks evidence of that close pathological investigation which we strongly advise in all such cases. It need, therefore, be referred to only very shortly. The abscess was suprahepatic in position, lying between the layers of the broad ligament of the liver. He found that the pus was free from organisms, and accounted for this by saying that the abscess was not near to any source of direct infection. The original source of the abscess, he thinks to have been a chill, and negatives dysentery in connection with the case. It is abundantly obvious that this pathology is very defective, and greatly lessens the value of the author's contribution. Pus never has its origin in a chill, and though an abscess has no organisms when examined, they may have been plentifully present at an earlier period. Other recent instances of subphrenic abscess might be also referred to, but the above will suffice to show that the general pathology of the condition, now fairly well known, ought to receive more wide attention than it seems to have done.

The Plague.

Fortunately this dread disease, though for some months now so near our shores, has not so far found a landing there. We sincerely hope that this good fortune will continue, but the untoward contingency might occur at any time, and it will be well if practitioners, especially those in seafaring towns, will familiarise themselves with its main clinical and pathological features. Cantlie (*Practitioner*, London, Nov. 1899, p. 522) contributes a timely paper upon the disease, under various headings, some of which may with advantage be noticed here.

I. Clinical Types.—1. *Bubonic form.*—As a rule, the first attack is bubonic, all the glands being affected in many cases, though those of the groin most frequently.

2. *Pneumonic type.*—Signs of respiratory mischief, bronchitic or pneumonic, are the sole or most prominent features in the case.

3. *Intestinal type.*—Symptoms referable to the bowels are always a feature of the disease; thus, there is generally constipation, or there may be diarrhœa, or the two may alternate; but occasionally they are nearly the sole symptoms, the disease beginning as an intestinal flux, soon followed by blood, mucus, and epithelium in the stools.

4. *Nervous type.*—Nervous phenomena are always a feature in the disease, but occasionally they overshadow all others, either an excited and delirious state, or an apathetic, listless condition. Such cases have been called cerebral.

5. *Puerperal type.*—Cases in which hæmorrhage from the uterus and miscarriage were prominent.

6. *Toxic type.*—Sometimes called siderans or sometimes septic, where the cases are rapidly fatal, with signs of toxæmia without any obvious anatomical lesion.

7. *Typhus type.*—A somewhat similar type, in which the symptoms and signs closely resemble those of malignant typhus fever.

8. *Ambulatory type,* where the symptoms are chiefly bubonic, and so mild that the patient is not prevented from following his ordinary avocations.

9. *Minor type,* called often Pestis Minor, where there are sporadic or epidemic attacks of adenitis. They often precede, run concurrently with, or follow upon, an epidemic of severe plague. All authorities are agreed upon the immense importance of working out the relations which exist between this minor and the major forms.

II. DIAGNOSIS.—While it is true that (1) the characteristic physiognomy, (2) the staccato speech, (3) the peculiar furring of the tongue, and (4) the presence of a bubo, present a pretty clear picture, there yet remains the fact that the only reliable means of diagnosis is a bacteriological one. There can be no longer any doubt when the characteristic bacillus is found. It is a short thick rod with rounded ends, about 1 c.c. in length and ·3 c.c. in breadth, staining readily with most dyes, and generally more deeply at the ends than in the middle. Its mere microscopic examination is not, however, sufficient. Its peculiar stalactite (Haffkine) growth in bouillon ought to be obtained. The bacillus can easily be found, if there be a discharging bubo, as it is present in the pus in great numbers; but if the glands should be only swollen, then a hypodermic needle may be introduced into the inflammatory œdematous area in the neighbourhood of the bubo, and a little of the sanguineous fluid withdrawn. If this fails, a small puncture or incision may be made into a bubo. In cases where there is no bubo, the attention may be directed to the system mainly involved. In pneumonic cases the sputum contains immense numbers of the bacilli, in intestinal cases they may be got in the fæces, and in many cases also from the urine. Lastly, there is the blood. In a certain proportion of cases only are they to be found in the blood of the peripheral circulation, as they generally exist there in scanty numbers, and then usually late in disease.

III. COMMUNICABILITY.—Rats and mice are most susceptible; guinea-pigs, pigs, rabbits, monkeys, and fowls are also susceptible, but to a less degree. Cats are rendered but slightly feverish by inoculation, and pigeons are non-inoculable. The infection is usually carried by the food, although it may enter by the respiratory channels or by the skin. In the second it is probably only by means of the sputum, for it is improbable that the breath carries it, and in the latter it is through an abrasion or wound. It is more readily transmitted to certain animals than to man. Rats, for instance, placed in clean cages next to others inhabited by affected animals may become infected, whereas the danger of healthy human beings becoming infected by persons ill of plague is remote. Rats and mice are the great transmitters, through their fæces getting into human food, or through flies alighting on their affected carcases, and afterwards upon human food. The bacilli will not keep alive in grain more than six or seven days, but wherever there is grain there is likely to be rats, and by them the infection may be kept alive indefinitely. The death rate is very high, as much as 90 per cent., among the natives in Anglo-China or India, and about 80 per cent. under European care in hospitals. A comparatively small number of Europeans have been attacked, and in them the mortality has been about 50 per cent. The mortality has been reduced by Haffkine's prophylactic, by at least over 50 per cent. Other authorities give it as high or even higher than 80 per cent., based upon the results of over 100,000 inoculations. Thus protected, individuals are safe for a certain period, probably at least seven months.

DERMATOLOGY.

UNDER THE CHARGE OF

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How the Skin Protects Itself against Microbes.

Sabouraud in a novel and suggestive article (*Ann. de dermat. et de syph.*, Paris, August and September 1899) observes that when one studies works of pathological histology, dealing with cutaneous diseases, it is impossible not to be impressed with the dryness, the confusion, and the paucity of interest which they commonly present. In fact, the defects of these works in this respect form an excuse for those who do not read them. Even now the pathological anatomy of each cutaneous lesion is lost in a labyrinth of details, bristling with technical and barbarous epithets, without ever conveying a general conception. In a study of any point whatever of pathology, the chief business of an anatomist ought to be, first to understand himself, and then to enable others to comprehend the facts which regulate the evolution of the lesion, and those which explain its mechanism. Beside these facts the rest is but rubbish. Thus all the lesions of the parasitic dermatoses can be readily systematised, since the elementary morbid reactions of the skin are very simple. The skin has but three organs of defence against micro-organisms. These are—(1) Its epidermic covering; (2) its fibro-elastic structure, the true skin; and (3) the migratory white corpuscles which circulate through these. Each constituent organ of the skin defends itself by the exertion of its own special function. But the differentiated cell has no longer the indefinite properties of the unicellular being, it has preserved and elaborated only a restricted number, but with singularly enhanced power. Thus the epithelial cell defends itself, and cannot defend itself otherwise than by its function, which is to make the horny cell. In the same way the fibrous cell defends itself by creating a fibrous coat, since this is all it knows how to or can do. And the white corpuscle, the cell which by its origin, its office, and its migrations, recalls the unicellular amœba, defends itself like it by fastening on its enemy, enveloping it, and feeding on it. The epidermis reforms its keratinised layer under the microbian lesion, and closes before it the barrier which it had broken and crossed. The invaded dermal meshwork surrounds its besieger with a fibrous envelope more dense than itself. And, lastly, the white corpuscles assemble round the microbe, encircle and digest it. Thus the mode of strife differs for the three organs just as their normal function. That of the epidermic cell is keratinisation, hence it casts out the microbe, proceeding by eviction; that of the connective tissue cell is fibrosis, hence the derma thickens the investment, proceeding by inclusion; that of the wandering leucocyte is phagocytosis, hence the migratory cells absorb and destroy by digestion. Each of these has its special symptom for the clinician. So the epidermic renovation is to the observer's eye exfoliation; the fibrous inclusion betrays itself to the finger as deep induration; while the struggle of the migratory cells when perceptible becomes suppuration. These different methods may coexist but never mask each other. But we find laid down as pathological lesions of inflammation of the epidermis such changes as spongy, vacuolar, hyaline, granular, œdematous transformations of the epidermic cell, intercellular œdema, lessening of or disappearance of the eleidin, mitoses and amitoses, all heterogeneously muddled up. Really all that occurs is that the successive layers of the horny epidermis form too quickly and too thick, but these do not exfoliate as rapidly as they form, since their keratinisation is not complete. In the thickness of the epidermis the daughter layers of the basal one, which pass through their transformation by regular strata, are disturbed in their mutations, due to a hyperactivity of their normal function. The first of these is hyperkeratosis, the second is parakeratosis, which includes all those changes mentioned above. The rapidity of the growth of new epidermis is remarkable. In a single night a thick scale, made up of thirty lamellæ, will form on a denuded patch of psoriasis. Microbes are constantly found between epidermic horny cells, but such is their power of resistance that they are not encountered within them. But the leucocyte comes also to the defence of the epidermis. Thus the elementary lesion of psoriasis is a fine erosion of the horny layer, filled up at once by the immigration of white cells which have crossed the mucous layer. Beneath the horny layer, reduced to a film of single cells, a collection of migratory cells forms. The superficial layers of the epidermis react by an intense hyperkeratosis, and the whole lesion with its white cells is cast out and separated from the skin by a freshly formed horny layer. Below this, however, the unknown germ of psoriasis persists at one particular point, a new leucocyte assemblage forms under the first scale, giving rise to a fresh hyperkeratotic reaction. This is repeated till there may be ten or twenty leucocytic abscesses, which exhibit only the dried nuclei of leucocytes embedded in packets of new horny cells. The derma defends itself by organising a fibrous cocoon round any commencing abscess or tubercular deposit. Tubercular diseases progress slowly in the skin, because the fibrous framework there composes the whole organ, while in the viscera the framework is reduced to a minimum, as much space as possible being allowed to the cells proper to the viscus. When a viscus resists the intrusion of microbes, it is at the expense of its fibrous framework, which forms a thick connective tissue cocoon round the microbian focus. This illustrates the importance of the fibrous nodule in the singular modification of the most severe cutaneous infections. Within the nodule a process of defence is carried out by leucocytes. This is shown—(1) By a tendency to the formation of giant cells. These he believes to be single leucocytes, enormously hypertrophied with multiplication of their nuclei. (2) The replacement of polynuclear cells by fibroid ones. (3) There occurs a fibrous organisation within the nodule, the original abscess turns into a fibroma. It is thus that the tubercular nodule of lupus becomes cured when this happens spontaneously. The characters of the leucocytic defence become specialised when the struggle is circumscribed to the interior of a fibrous nodule.

Lichen Scrofulosorum in a Negro.

Notwithstanding the very clear description originally given by Hebra of this somewhat rare disease, it has failed to be precisely diagnosed in various cases, while the conflicting accounts of its characters which have been given by different authors, show that identical conceptions regarding it are not universally held. An abstract of a case recorded by a most careful observer, Caspar Gilchrist, is therefore of interest (*Johns Hopkins Hosp. Bull.*, Baltimore, May 1899). A negro girl, æt. 11, was brought to him with patches on the back and thighs, noticed a few days previously, and thought to be ringworm. There were round and oval patches on the regions named and on the pubes, from 10 to 20 mm. in diameter. These consisted of groups of small, conical, slightly scaly and therefore whitish firm papules, each about 0·5 mm. in diameter, raised and presenting a flattened summit, which was covered with a somewhat adherent but not profuse whitish scale, on removal of which a bleeding surface was exposed. The papules everywhere were alike in size, were discrete, and had a slight red areola round their base. In the oldest groups, those in the groin, the central portion seemed clearing up, but close inspection revealed the remains of flattened, slightly scaling papules. Many of the lesions were pierced by lanugo hairs, being seated at hair follicles. New lesions developed while she was under observation, on other parts, as the abdomen and arms. Five weeks after the first appearance of the eruption, a typical phlyctenular conjunctivitis developed. Numerous enlarged lymphatic glands were also present, but such occur frequently in healthy negroes. Under the internal administration of hypophosphites and cod-liver oil, the cutaneous and eye troubles rapidly disappeared. The sections exhibited two striking features—(1) Semiglobular-looking masses situated in the horny layer, and in the majority of instances around the hair follicles, and (2) marked pathological changes in the upper portion of the corium beneath these papular masses, and also round the hair follicles, especially the deepest portion. The latter were characterised by their tubercular structure. There was dilatation of the blood vessels, emigration of polynuclear leucocytes, and the presence of lymphoid cells, but without apparent fluid exudation. There was hyperkeratosis round the hairs, though the follicles themselves were unaffected. Near these, however, typical tubercles were observed, with giant cells forming the centre, with many epithelioid cells and mononuclear round cells at the periphery. No tubercle bacilli were found in any section stained for these. Clinically the case showed all the features of a lichen scrofulosorum, as originally described by Hebra, with the exception of the colour, which would naturally differ in a negro's skin. It is strange that a tubercular cutaneous eruption, which yielded so readily to cod-liver oil, should arise in a well-fed, healthy child with good hygienic surroundings and without previous history of tuberculosis.

Chronic Primula Dermatitis.

Instances of cutaneous inflammation, in consequence of contact with the *Primula obonica*, are now well known; such have been usually acute disorders, those where a single exposure has evoked an acute dermatitis. But Heuss (*Monatsh. f. prakt. Dermat.*, Hamburg, 1st July 1899) draws attention to a less recognised variety, in which the *Primula dermatitis* assumes the type of a chronic constantly recurring eczema, which, defying all anti-eczematous treatment, only gets thoroughly well when the mischievous agent has been put away. The appearances are those of a chronic, dry, seborrhœic eczema. There is slight infiltration of the integument, moderate production of scales, fissures, severe itching, the occurrence of isolated vesicles and papules with little inflammatory change. It is almost exclusively confined to the hands and face, or the neighbouring uncovered parts, favouring particularly the back of the hands, the interdigital spaces, the bulbs of the thumb and little finger. It is not unfrequently asymmetrical, while in genuine seborrhœic eczema, other regions, as the flexures of the joints, the scalp, etc., are commonly involved, both sides equally. No habituation or immunity is attained; it recurs at each fresh exposure. Yet many are not liable; and notwithstanding the energetic and repeated friction of the skin of several females with the leaves, no dermatitis ensued. Women are far more frequently affected than men, and it would appear that their greater susceptibility is due to the nature of their skin. In his cases the skin was dry, fine, and well cared for. This view is supported by the readiness with which the thin skin of the interdigital spaces is attacked, in comparison with the rarity of the more exposed but thicker integument of the palms. A contributory element may be a proneness on the part of the skin to catarrhal processes, a "weak" skin, like a "weak" stomach. The hairs on the leaf of this primula consist of two sorts—(1) Long, composed of from three to eight columnar, superimposed cylindrical cells, united together towards the point; and (2) short, almost knob-shaped hairs, made up of only two to three cells, of which the outer round or vesicle-like are full of a strongly refracting, watery, or yellow fluid, probably the irritating material.

THERAPEUTIC GLEANINGS.

H. S. PURDON (*Dublin Journ. Med. Sc.*, August 1899) finding that cutting off *warts* is apt to leave a scar, while acids commonly irritate and often spread the verrucous growths, recommends wearing continuously an indiarubber finger-stall if on the digits, an indiarubber bandage if on the hands or feet. This is sufficiently tight to exercise gentle pressure, while the wart is kept moist and macerated from retained perspiration. He was first led to try this for the removal of warts on his own finger, and in six weeks they had vanished, and since then he has found the plan uniformly successful. Unna (*Monatsh. f. prakt. Dermat.*, Hamburg, 15th August 1899) points out that powerful oxydising substances are of great value in softening, depigmenting, and clearing up the horny layer of the skin. This action is specially indicated in the hyperkeratoses of acne, in keratoid eczema, in lichen planus, in diffuse keratomata, and in the bluish black punctations met with in middle age, either alone or complicated with acne or seborrhœic dermatitis. An alkaline oxydising agent is particularly desiderated, and this he has discovered in *peroxide of sodium*, now manufactured in commercial quantities. An initial difficulty in its employment arose from the circumstance that the oxygen was apt to separate from its combination with too great violence. Moisture increased this instability, while glycerine gave rise to ignition and explosion. Finally, he solved the problem by incorporating the salt with a soap composed of three parts of liquid paraffin and seven of thoroughly exsiccated medicinal soap. Various strengths of this can be prepared, from one of 20 per cent. to one of 2½. Some of this soap is put on a pledget of wet cotton-wool, and rubbed on the skin till the application becomes fairly painful, the lather is then washed off with water. The stronger varieties are used at first and in obstinate cases, afterwards the weaker are resorted to, since these can be used both longer and more frequently. He does not know any other chemical substance which can convert the skin of the face, when pale, unduly cornified, studded with comedones, and dotted with black points, into that with a rosy healthy colour and pure soft surface. Its continuous use has a favourable effect on indolent acne scars, so difficult to efface even mechanically by remedies calculated to induce exfoliation. He has likewise got good results from the employment of this soap in rebellious cases of rosacea pustulosa occurring about the climacterium, and there are probably other ailments in which it would prove beneficial. According to the observations of Stojanovitch (*Ann. de dermat. et de syph.*, Paris, August and September 1899, p. 813) a 50 per cent. watery solution of lactic acid has a powerful effect in curing *alopecia areata*. This when applied causes an irritation which may last twenty-four hours, so that it should only be used once a day. Should the irritation prove too great, the application is to be suspended for a time, and possibly an anodyne pomade put on. Properly used, it is without any drawback, the pain is generally bearable, and it leaves no scars. It occasions a rapid regrowth of hair, while it arrests further extension of the disease. When the scalp was attacked, the appearance of down was always rapid, however long the duration of the baldness, with exception of one instance, and, in the large majority, cure was complete in three months. When the beard was affected, down was visible in a fortnight, but the complete cure was slower. Skinner (*Brit. Journ. Dermat.*, London, June 1899, p. 238) advises the following as being simple and often successful in allaying the itching, burning sensation experienced in *urticaria*, and so resistant to treatment:—℞ Liq. hamamelidis, 2 fl. oz.; Sal. maris, ½ oz.; Aq. destillat. to 1 pint. To be applied freely.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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The Diagnosis of Pleurisy with Effusion in Children, by means of Metallic Percussion.

Moussons considers that in metallic percussion we have a valuable addition to the ordinary methods of diagnosis employed in the detection of pleural effusion in children. He calls attention to the perplexing nature of many of the physical signs in such cases, and points out that the sounds elicited by percussion and auscultation do not bear the same interpretation in the child as they do in the adult. He indicates how frequently purulent pleural effusions are confounded with croupous and broncho-pneumonia, and with tubercular infiltrations, and he maintains that if metallic percussion were made part of the routine procedure in examining children suffering from lung trouble, many of these mistakes might be avoided. Following the lead of Trousseau, who first demonstrated the value of the coin test in cases of pneumothorax, Pitres, and associated with him his pupil Sieur, conducted an elaborate series of investigations in adult patients, to show that metallic percussion might prove of service in cases other than those of pneumothorax.

The result of their investigations may be briefly stated as follows:—(1) When the chest is healthy, the transmitted note from the coins used in percussion is obscure and smothered, and is absolutely without metallic timbre; (2) whenever effusion is present, whether it be serous, purulent, or sanguineous, in a cavity free from adhesions a perfectly clear metallic sound is transmitted. On the other hand, they were unable to elicit this sound in the different types of pneumonia or in new growths, and the same was true with regard to tubercular deposits, encysted pleurisies, and pericardial effusions. They found that they could not only recognise the presence of an effusion, but were able to indicate the height of the fluid in cases of pleuro-pneumonia, and could further detect the position of the zone of dulness corresponding to the effusion, in cases of pleurisy complicated with false membrane. During the last two years Moussons has submitted all the children coming under his observation, suffering from pulmonary or pleural affections, to this test. The percussion ought to be gentler in the child, and the ear not employed in auscultating should be deafened. He found that in the child as in the adult the metallic sound is deadened in traversing the healthy chest, and loses its anvil character. In all croupous and catarrhal pneumonias which he examined, the results were practically the same. The transmitted sound was not only impure and without metallic ring, but the perception of the actual stroke of the coins on one another was very feeble and notably duller than on the healthy side, while in some cases it was absolutely imperceptible.

In the majority of cases submitted to examination in which fluid was present in the pleural cavity, metallic percussion gave a very clear and unmistakable sound, as in the adult. In a small number of cases in which the test was less satisfactory, the sound was much better transmitted than on the healthy side, although lacking some of the characteristic pure silvery quality.

The author records the results of his experiments in the cadavers of six young infants and one older child, by injecting their pleural cavities with varying quantities of fluid. In no case was the metallic timbre present before injection, whilst the sign was clear and unmistakable after the injection had been made in all but two of the cases, and in them also a successful test was obtained on injecting a larger quantity of fluid. The paper concludes with the expression of the opinion that this sign, without being absolutely pathognomonic, is of great importance in facilitating the diagnosis in a class of cases which is often beset with great difficulty.—*Rev. mens. d. mal. de l'enf.*, Paris, Janvier 1899.

IRRIGATION BY SUBMERSION IN TREATMENT OF EMPYEMA.

IN this paper Zeman's method of washing out the cavity of the pleura by means of baths is described, and several of his cases are given in detail. He considers the usual method of washing out the pleural cavity unsatisfactory, as only the liquid matter is removed, while many products of inflammation adhere to the pleura, thus keeping up irritation. The author accidentally hit upon the following method of washing out the pleural cavity. In a case of empyema which he had incised, and resected a portion of rib, a large quantity of pus escaped, after which the cavity was irrigated with a salt solution. The following day the patient literally swam in pus, and after being again irrigated, a bath was ordered for cleansing purposes, in which the level of the water was to be below the opening in the thorax. Owing to some misunderstanding, the patient was put into a full bath, and it was noticed that with each inspiration the water entered the pleural cavity with great force, and was as forcibly expelled with each expiration, carrying with it a great mass of thick pus and fibrinous coagula which had remained behind in spite of irrigation. On placing the finger over the wound in the chest wall, it was drawn towards the opening into the pleura with considerable force. From that time the patient was given a daily bath of filtered boiled water, at a temperature of 95° to 99° F. The bath usually lasted about fifteen minutes. In several other cases of empyema the author pursued the same method, and obtained equally good results. The greater force of the inflow of water when inspired than when introduced by the irrigation explains the removal of the large masses of fibrinous material and thickened pus. In washing out with an irrigator the water does not reach all parts of the pleural cavity, which undoubtedly occurs when the patient is placed in a bath.

His reasons for preferring this method are—(1) It is simpler, cleaner, easier, and in the ten to fifteen minutes that the patient is sitting in the bath he will be washed out two or three hundred times instead of three or four. (2) There is economy in dressings, as by removing the thickened water there will be less irritation and therefore less production of pus. (3) The baths improve the general condition of the patient, causing better metabolism.—*Trans. Am. Pediat. Soc.*, Phila., vol. x. p. 80.

X-RAYS IN THE EXAMINATION OF CHILDREN.

DR. WILLIAMS draws attention to the value of thoracic examination by means of X-rays in doubtful chest cases in young children. Care must be taken in making such examinations to avoid too powerful a light, because the contents of a child's chest are so easily traversed by the rays, that if this precaution is not taken the shadow cast upon the screen may be smaller than the actual dimensions of the organs, owing to the penetration of their edges by the rays.

After conducting no fewer than three thousand examinations, he had found the X-rays exceedingly useful in detecting at an early stage the presence of pneumonic areas in the lungs of young children before he was able to recognise them by means of physical signs. Especially useful did he find this method of examination in pleurisy with effusion and empyema, and in any other condition of the lung which would make this organ less penetrable by the rays than normal. The size and positions of the spleen and liver and also of the kidneys, especially the left one, are more readily determined in children than in adults. He had frequently demonstrated the changes in the shape and size of the stomach during a meal. This latter examination was facilitated by giving the child a large doze of subnitrate of bismuth before the administration of food.—*Boston Med. and S. Journ.*, July 1899.

ABSCESS OF THE BRAIN IN INFANTS.

IN this paper Holt reports at considerable length five cases of abscess of the brain in infants, together with a summary of twenty-seven collected cases, from the study of which he draws the following conclusions:—(1) Abscess of the brain in children under 5 years is rare. (2) The principal causes are otitis and traumatism. (3) It rarely follows acute otitis, but most often neglected cases, and is usually secondary to disease of the petrous bone. (4) In cases occurring in infancy, without evident cause, the source of infection is probably the ears, even though there is no discharge. (5) The development of abscess after injury to the head without fracture of the skull, is extremely rare. In nearly all of the traumatic cases definite cerebral symptoms show themselves within the first two weeks after the injury. In cases with falls as remote as several months there is probably some other cause, such as latent otitis. (6) In a large proportion of the cases only general symptoms are present, and those in great variety. (7) Focal symptoms may be misleading unless they are constant, and even then they may depend upon associated lesions such as meningitis. Motor symptoms only can be trusted, as sensory symptoms are often impossible to determine in children. (8) Rapid progress, fever, and the history of an injury, or otitis generally make a diagnosis from tumour easy. (9) From acute meningitis the diagnosis is more difficult, and when only terminal symptoms are present it is often impossible. In more protracted cases the symptoms pointing to abscess are slower course, and as a rule lower temperature. (10) Operative interference should not be advised in children, owing to the great amount of shock induced, unless definite localising symptoms exist, the principal one being hemiplegia.

Holt considers the diagnosis of these cases in children attended with extreme difficulty. Many of the symptoms which in the adult are of great value, such as visual disturbances, tenderness of the scalp, and one-sided deafness, are unreliable in the child. We can, however, be reasonably sure of brain abscess when we find a recently healed scar on the scalp with history of a punctured wound, or where we have a long-standing otorrhœa or mastoid abscess followed by hemiplegia, developing either slowly without fever, or rapidly, with high fever, vomiting, and convulsions.

Great doubt must always exist in the prolonged cases with slight fever when we have no previous history to guide us. On account of the position of these abscesses, the symptoms are far more frequently general than focal. The greatest difficulty occurs in differentiating between abscess and meningitis, and it is often impossible. The case is more likely to be one of abscess if the symptoms supervene after an injury, whether they commence with headache, vomiting, convulsions, and fever, or more gradually accompanied by paralysis, but without fever. The paralysis is apt to be more complete and persistent, the course slower and more irregular, than in meningitis.

As a rule it is not so difficult to distinguish between abscess and tumour. In tumour, cranial nerve symptoms are more frequent and prominent, and irritative symptoms such as localised convulsions more marked, while pressure symptoms are less unless the tumour is so situated as to involve the ventricles. Tumours being smaller than abscesses, focal symptoms are generally more definite. The discovery of pyogenic organisms in the fluid obtained by lumbar puncture, makes the diagnosis of abscesses or meningitis practically certain, though it does not indicate with which one we have to deal.—*Arch. Pediat.*, N. Y., 1898, vol. xv. pp. 81–163.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society, *6th December* 1899.—Mr. A. G. Miller, President, in the chair.—Mr. Wallace showed a patient after pylorectomy by Kocher's method.—Mr. Stiles showed—(1) A child after operation for severe deformity following a burn of the ankle; (2) a child with a ventral hernia after operation for suppurative appendicitis; (3) an infant, three months old, after operation for intussusception secondary to acute appendicitis. — Dr. Scot Skirving showed—(1) A patient after removal of gangrenous appendix with general peritonitis; (2) patient after subperiosteal resection of the lower jaw (with specimen).—Mr. Wallace showed—(1) Tumour removed in case of pylorectomy; (2) tumour of pituitary body; (3) calcareous mass from cerebellum; (4) fractured skull; (5) calculus in ureter.—Mr. Miles showed—(1) Enchondroma of femur (with stereoscopic photographs); (2) two cases of excision of the cæcum; (3) several specimens of fracture of the base of the skull (with photographs).—Dr. Harvey Littlejohn showed—(1) Dermoid cyst of the ovary; (2) calcareous degeneration of the heart.—Dr. Scot Skirving showed perforated appendix with concretion.—Dr. A. D. Webster showed an apparatus for applying hot air to mucous surfaces.—Dr. Gulland showed microscopic slides illustrating Cohn's method of showing fat in urinary deposits and other fluids.—Dr. C. W. MacGillivray read a paper on the radical cure of hernia, with statistics of seven years' experience in the Royal Infirmary. The operation may be—(1) Imperative, as in strangulation or other complication dangerous to life; (2) necessary, *e.g.*, when a truss fails to keep the hernia up or the patient is unfitted for his ordinary occupation by reason of his hernia; (3) advisable in poorer classes when truss cannot be worn because of laborious work; in congenital hernias in poor people, when truss if worn is not looked after; when truss is inconvenient for patient; when the hernia is a bar to congenial occupation or public services. The mortality is practically nil in uncomplicated cases in children, but it increases with the age of the patient. As regards the method employed, he would advise the simplest method possible in children and in imperative cases, but in adults a more thorough method should be adopted, if success is to be obtained. The use of a truss is not necessary. Of ninety-one operations, ten cases died. Eight of these were cases of strangulation; and of the remaining two, one died of chloroform sickness and the other of double pneumonia. The wounds in these two healed by first intention. Seventy of the cases were inguinal hernia, seventeen femoral, and four umbilical and ventral. The death-rate was 3 per cent. An interesting discussion followed.

Edinburgh Obstetrical Society, *Wednesday*, 13*th December* 1899. —Dr. Milne Murray, President, in the chair.—Specimens were shown by the President, Professor Simpson, Dr. Lackie, and Dr. Haig Ferguson.

Communications.—Professor Kynoch read a paper on "Vaginal Cœliotomy." He first of all reviewed the history of the operation and discussed the various methods of performing it. He then considered the numerous indications for adopting the vaginal route, and, in illustration, described in detail several cases in which he had performed this operation. He contrasted the advantages of the vaginal as opposed to the abdominal incision, and held that in many cases the former was preferable.—The President read "Notes of a Case of Pyosalpinx removed by Laparotomy in the early Puerperium." The patient had been seen before she became pregnant, when she was found to be suffering from left salpingo-ovaritis. During the last few weeks of gestation she complained of acute pain, and on the second day after delivery the patient developed all the general symptoms of acute sepsis. Rupture of a pyosalpinx was diagnosed, and Dr. Murray at once recommended the opening of the abdomen. This was done, and the left Fallopian tube, which was distended and contained pus, was removed along with the left ovary, which was acutely inflamed and showed on its surface numerous recent adhesions. The patient made an uninterrupted recovery.—Dr. Simeon Paterson read a paper on "Rapid Death following Labour, due to Cardiac Disease." The patient was confined at 8 a.m. and died on the evening of the same day, with all the symptoms of pulmonary embolism which was diagnosed. It was, however, ascertained that the patient during her pregnancy had frequent attacks of dyspnœa, and on post-mortem examination it was found that she had old standing mitral disease, chronic venous congestion of the lungs, and a recent fibrinous pneumonia. Dr. Paterson had not seen her before he was called to her confinement.

Glasgow Medico-Chirurgical Society, 15*th December* 1899.—Dr. Kennedy showed—(*a*) Two cases of appendicitis. The first case was that of a man, æt. 28, who had had several attacks. The appendix, which was enveloped in adhesions, dense in front and weak behind, ruptured on its posterior aspect. The patient made a good recovery. The second case was that of a boy, æt. 13, who was admitted to hospital with symptoms of intestinal obstruction. On opening the abdomen in the middle line, a general peritonitis was found, and on the region of the appendix a large quantity of pus gushed out. A second incision was then made over the appendix. The abscess cavity was drained. (*b*) Excision of epithelioma of lower lip. The lower lip was excised, and a new lip formed by Trendelenburg's method. (*c*) Gumma of the mamma in a woman, æt. 30, who had contracted syphilis in 1896.—Dr. Rutherford showed a case of resection of ribs for empyema.—Dr. G. Henderson Nicol showed the following cases:—(*a*) An infant with congenital obstruction of the pylorus. From fifteen to twenty minutes after each meal the child regurgitated everything, and remained quite comfortable till the next meal. Through the parietes could be seen the outline of a dilated stomach. The condition was diagnosed by Dr. Ritchie, who called in Dr. Nicol. On opening the abdomen, Dr. Nicol found a much thickened pylorus. He incised the stomach and dilated the pylorus. The child is now thriving. (*b*) Perforating gastric ulcer excised six days after perforation. Recovery was complicated by acute suppuration of the middle ear, phlegmasia and septic pneumonia. The patient is now in good health. (*c*) Ruptured tubal gestation, operated on the day of rupture. (*d*) Calculi from three prostatic cases in which the calculous formation was secondary to and masked by the symptoms of the prostatic hypertrophy. (*e*) Photograph of a case of congenital absence of a number of bones in hands and feet.—Dr. W. K. HUNTER, in the absence of Dr. LINDSAY STEVEN and Mr. JAMES LUKE, demonstrated the case of a patient who was trephined on account of right-sided hemiplegia with aphasia, due to a cyst of the left motor area, large enough to contain the closed fist. The hemiplegia and aphasia have now disappeared.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY, 11*th December* 1899.—The President, DR. THOMAS BARR, in the chair.—Dr. T. SPENCE MEIGHAN showed—(*a*) A girl, æt. 19, who had suffered from extreme divergence of both eyes, due to congenital absence of the internal recti. He had operated, and had succeeded in bringing the visual fields in contact at their margins, but they did not overlap. There was neither binocular vision nor diplopia; (*b*) a child, the subject of a very extensive coloboma of the left upper eyelid, not yet operated upon. A dermoid cyst the size of a pea was situated on the inner part of the cornea, and two supernumerary auricles were present on the same side of the head.—Dr. DAVID NEWMAN gave an account of two cases in which small renal calculi were removed from the ureter by operation through the bladder. The calculi had become impacted in the vesical extremity of the duct, and had projected into the bladder, pushing before them a covering of mucous membrane. He also showed Casper's instruments for catheterisation of the ureters.—Dr. G. BURNSIDE BUCHANAN showed —(*a*) A large sarcoma of the internal popliteal nerve, from a patient who had motion and sensation below the knee, with the exception of some anæsthesia on the outer side of the sole of the foot. Microscopic specimens by Dr. A. R. Ferguson showed the tumour to be of the round-celled variety; (*b*) A large urinary calculus which had been impacted in the prostatic urethra, and which had been removed by perineal section.

CARD SPECIMENS were exhibited by Dr. G. BURNSIDE BUCHANAN—Pedunculated osteo-chondroma from the lower end of the femur, with skiagram by Dr. Mackintosh.—Drs. G. H. EDINGTON and A. R. FERGUSON—(*a*) Fused kidneys on the right side, cancer of bladder, septic mischief extending to upper kidney by its ureter—which was much thickened; (*b*) horseshoe kidney, with dilated pelves.—Dr. JAS. F. GEMMILL—Drawing, reconstructed from serial sections, of a fused kidney from a human embryo of ten weeks.

FORFARSHIRE MEDICAL ASSOCIATION, 1*st December* 1899. — Dr. TEMPLEMAN in the chair.—Professor MACEWAN gave notes of a case of tracheal stenosis following cut throat in a man aged about 40. After the wound healed, it was found necessary to perform tracheotomy, owing to his gradually increasing difficulty in breathing. He improved, the tube was removed, and he was dismissed from the hospital. Some time afterwards it was found necessary to open up the old tracheotomy wound and reintroduce a tube. An attempt was then made to treat the tracheal stenosis by the passage of bougies upwards. After a time the tracheotomy tube was withdrawn, but the stricture tended to contract. Prof. MacEwan now got an intubation tube made, similar to O'Dwyer's tubes, but much longer and broader. This was daily passed through the stricture, and the patient was able to do without the tracheotomy tube. The patient has now returned to work, having had no difficulty of breathing for the last four months. Professor MacEwan then made some remarks on the value of intubation in laryngeal diphtheria. He quoted statistics of his own from which he considered that in many cases intubation was preferable to tracheotomy. He then discussed the difficulties and dangers of intubation, and pointed out that in his experience pushing down of the membrane had been a rare occurrence, and that blockage and ejection of the tube were difficulties which could be got over by an intelligent nurse. He advised the use of larger tubes than those recommended by O'Dwyer.—Dr. Buist read a paper on the means which should be adopted to prevent occurrence of ophthalmia neonatorum. In it he gave statistics in cases where no prophylactic treatment had been adopted, and where some had been adopted. If there is a vaginal discharge, then frequent douching should be carried out, careful washing of the vulva and bathing the eyes of the child with boracic lotion. If the discharge is gonorrhœal, then the eyes of the child should at once be swabbed, and a solution of silver nitrate, 10 grs. to the ounce, should be applied to the palpebral conjunctivæ.—Dr. M'Gillivray followed with a paper on the treatment of the disease when once established. This consisted in the daily application of a 2 per cent. solution of silver nitrate to the palpebral conjunctivæ, together with the frequent removal of secretion, even every half hour, by means of tepid physiological salt solution and the bathing of the eyes with formalin solution (1 in 2000). In the case of corneal complication, besides the treatment already suggested, atropine drops should be applied thrice daily. Under prompt, careful, and energetic treatment on the lines indicated, it was pointed out complete recovery could invariably be obtained.—Professor MacEwan gave notes of a case of subphrenic abscess on which he had operated. The patient was a man, æt. 40, who had complained of abdominal pains after meals. A few weeks later the abdomen became suddenly swollen, and remained so till admission. On admission, he was very breathless and in great distress. The liver dulness was replaced by tympanicity. Two incisions were made in the right hypochondrium, and the abscess cavity evacuated and drained. The patient failed to recover from the operation. The post-mortem examination showed a perforated ulcer of the first part of the duodenum adherent to the under surface of the liver, whence infection had spread to the upper surface of the right lobe of the liver, forming a large subphrenic abscess.

ANALYTICAL REPORTS.

Artificial Food Preparations (*continued*).

In addition to the dry preparations noticed in our last month's issue, we have received samples of Bovril Meat Powder and Carnigen. Bovril meat powder, as becomes the Company manufacturing it, is a thoroughly first-class product, prepared from beef, powdered and dried, forming a most nutritious, easily assimilable proteid food of high nutritive value.

Carnigen (La Société Anonyme "Ox Beef" Brussels: Leete & O'Connell, London, agents for Great Britain) is another meat powder, prepared from the best beef, with a very marked property of rapid solubility in water. It forms a light, almost colourless powder, the least coloured example of its class we have seen, largely aggregated into small masses, crisp to the touch (introduction of a finger into it causing a similar feeling and sound as that of a hard frozen uncompact snow drift, apart from the sensation of cold), and by some process in its manufacture has been formed into small friable and soluble masses, like effervescent powders, more readily acted on by solvents, and more easily made use of than are simple compact powders.

Semi-solid Preparations.

Bovril.—The two forms of Bovril, the form sold under this name, and that termed Invalid Bovril, are deservedly famous and popular. Made from prime beef, extracted in the cold, with a considerable proportion of ground-up fibrin obtained from the blood and myosin from the muscles of the animals added, the two preparations are stimulating because of the extractives contained in them, nourishing from the proteids present, and useful in helping metabolic processes by reason of the inorganic salts accompanying the other ingredients. The ordinary form of Bovril is more liquid, and contains less proteid and extractives, but much the same proportion of inorganic salt as Invalid Bovril, forming a more mobile semi-solid than the latter, which indeed coheres, and has to be removed from its jar with the aid of a spoon. Both the forms have in our hands proved of the greatest service on occasion, especially the Invalid variety; and have often agreed where other things disturbed. The only point, perhaps, which they suffer from is the large proportion of salts; perhaps required for antifermentative purposes, this superabundance has more than once proved an obstacle to their administration. Nevertheless, Bovril constantly proves of immense service.

Carnos (Carnos Limited, Grimsby) is another of the beef extracts, somewhat cheaper than Bovril, which is also prepared in two forms, ordinary and invalid; it forms a very stimulating and palatable addition to soups, a useful non-intoxicant pick-me-up, and an easily digested food for invalids. Its proportion of phosphorus and of potassium salts is high.

Lipton's Extract of Beef is prepared from fresh ox beef, is of excellent quality, and possesses valuable properties. Its cost is practically the same as that of Bovril.

Armour's Extract of Beef is admittedly more valuable because of the properties of the extractives contained in it, than because of its actual nutritive powers, and may be used as a digestive stimulant, or a flavouring agent for soups, stock, etc.

Vigoral, prepared by the same firm, is made from the best extract, by the addition of a pure beef in a dry powdered form, and therefore is of a more nutritious character, and a useful dietetic stimulant in various circumstances.

Plumtree's Extract represents in each pound forty pounds of lean meat. It is largely an extractive stimulant.

Of the excellence of *Bellis' Turtle Soup and Jelly*, and of *Benoist's Turtle Soup*, we have had occasion to speak before this (vol. iv. p. 585; v. p. 214). Nothing nicer for an invalid who can afford these soups, which require no lengthy cooking to fit them for use, can be conceived; and at the same time they are strongly nourishing.

Brand's Essence of Beef is a well-known preparation of beef, introduced, as the manufacturers state, as a stimulant in weakened conditions. The essence in cold weather forms a jelly; in warm weather, a liquid. The clear jelly is easily taken when cold and readily digested.

Borthwick's Essence of Beef is a very similar preparation, with similar properties.

Bovril Beef Jelly falls under the same class, and is a very good example of a bland stimulating animal food, containing some amount of nutriment as well.

Vīrol and Marrol are prepared by the Bovril Company from bone marrow, the white marrow only in Marrol, both red and white marrow in Vīrol. The exclusion of the red marrow from Marrol renders it much the cheaper. Both forms offer the physician valuable opportunities for the administration of fats to infants and adult invalids in a readily tolerated state, in place of the time-honoured cod-liver oil and its various combinations. In addition to bone marrow, they contain raw eggs and extract of malt, and certainly possess a very high dietetic value, especially from the calorific aspect. Fats for children are as important as proteids, while excess of fat, if compatible with normal digestion, does good, not harm, unlike proteid over-plus. Diabetics, too, can gain advantages by the use of Vīrol sans sucre, which may be taken like a marrow savoury—hot on toast.

MEAT AND MALT WINES.

Two meat and malt wines submitted to us, Glendenning's and the Crown Brand, are both excellent examples of their class of combined dietetic and stimulant preparations. Both are compounded from malt extract, Mosquera's Beef Jelly (prepared by Parke, Davis & Co.), and old Alto Douro Port Wine. The malt extract used in Glendenning's wine is Kepler's (Burroughs, Wellcome & Co.). One commendable point about these wines is that they are not too sweet, and another, that the wine employed is undoubtedly of a high class, and thoroughly sound. The Beef Jelly, it is interesting to note, is obtained from beef after peptic digestion with Bromelin; an undoubted advantage, as the products of pine-apple proteolysis are entirely free from bitter principles.

SAW PALMETTO AND SANTAL OILS GLOBULES. COLCHICINE WITH METHYL SALICYLATE GLOBULES.

(Parke, Davis & Co., London.)

THE first sample of globules sent us by this firm, prepared and finished with their usual art and completeness, consist of capsules, each containing the amount of oil which can be extracted from a drachm of fresh saw palmetto berries, along with 3 minims of santal oil. Saw palmetto has obtained a great reputation, especially in America, in the treatment of female pelvic troubles; the virtues of santal oil are well known. The preparation is an excellent form in which to administer these drugs.

The second variety of globule contains colchicine and methyl-salicylate,—to all intent, a methyl-salicylate of the alkaloid. This compound has already been shown to possess advantages over colchicum preparations in the treatment of many gouty conditions, especially if there be a rheumatic element superadded; while for many people it is much less irritating to the gastro-intestinal tract.

CEREBOS SALT.

CEREBOS salt is so widely used that it hardly requires any words of praise at our hand. So compounded with a phosphate, calcium phosphate apparently, as to remove all the tendency to deliquesce, which is so annoying a property of common salt by itself, that it does not moisten nor lump, Cerebos is a fine powder, not so salt to taste as the pure article, but pleasant and very convenient for table use. The phosphate in it is perhaps of greater benefit in the prevention of caking, and in hindering attraction of moisture, than for dietetic purposes. Should a person consume no phosphorus compounds in his food, we can conceive it exercising some good effect, but otherwise the additional phosphorus ingested can hardly amount to much.

PEPTENZYME.

(Peptenzyme Co., London.)

ALREADY on a former occasion we have noticed this product. Clinical experiences of its effects since that time have commended it to us; it has certainly acted exceedingly well on several occasions. Mr. Carnick the discoverer describes it as made up of ferment extracts of a specified number of glandular organs, some of which are microscopic, and difficult to enumerate; but the fact remains that, whether the powder contains a proportion of zymogens equal to 999 Brunner's, or Lieberkühn's glands, instead of 1000, among those from the salivary, gastric, and pancreatic glands, and from the spleen and liver also, its administration has unequivocably proved of great service in our recent experiences, and it deservedly merits employment.

MISTURA CINCHONÆ ET GUAIACI COMPOSITA.

(A. K. Stewart, Edinburgh.)

THE powder generally known by the name of "Garrod's Powder" for use in the treatment of gouty and rheumatic conditions, although often efficacious if persevered with long enough, is, as those who have had to take it know well, a bulky, unpalatable medicament. The mixture, named as above, is a very successful attempt to provide a closely corresponding preparation in a liquid form, and with a less unpleasant taste. Containing iodide of potassium, citrate of lithium, extracts of colchicum, cinchona, and guaiacum, combined *secundum artem* with flavouring adjuvants, the mixture represents a valuable combination for employment in the treatment of gout and rheumatism, and their adjuncts. Practical experience of the results following its use have convinced us that it has a future before it. It is given in tablespoonful doses, and is one of those remedies which require a prolonged course before their full benefits can be rationally expected to be reaped by the patient.

XEROFORM.

(Von Heyden, Dresden. Agents, Burgoyne, Burbidges & Co., London.)

XEROFORM or tribromphenol-bismuth is a non-poisonous, antiseptic, almost odourless, non-irritating substitute for iodoform; insoluble in nearly all menstrua, and stable on heating until 248° F. is reached. Internally it may be given in the original powder in capsules or wafers, or as an emulsion, in doses of 7½ grs. for its intestinal antiseptie action; an action said to be very great. Externally it is employed as a dusting powder or ointment.

As 150 grs. of Xeroform have been taken in one day without harm to the patient, it is evident that there cannot be any dangerous properties owned by it, capable of producing accidental awkward results, such as have occurred now and again from iodoform. If all that Mikulicz, Hueppe, Reynders, Metall, and others, equally competent to judge, vouch for, be verified on actual trial, Xeroform has a future before it; at the present time its deserts merit trial.

ASPIRIN.

(Bayer & Co. Ltd., 19 St. Dunstan's Hill, London, E.C.)

ASPIRIN, the acetic-ester of salicylic acid, is a white powder, formed of minute crystalline spicules, somewhat the same as, though smaller, those of sulphate of quinine in appearance and aggregation. It is recommended as a substitute for the compounds of salicylic acid hitherto employed,—especially the salts of metallic or metalloid bases,—because it has none of that sweet cloying taste so soon repugnant to patients possessed by the latter; while it is said to pass through the stomach unaltered, and to be unirritating to the gastric mucous membrane.

It has, in fact, a rather pleasant, faintly acid flavour, and makes a very palatable mixture when a drachm of sugar and 15 grs. of aspirin itself are dissolved in half an ounce of water—the dose recommended. As it dissolves but feebly in water, though freely in spirit, the mixture is largely a suspension.

Practical experience already suggests that this new aspirant for the salicylic beneficial effects on disease presents promising features, and that it may well be worthy of trial where other compounds of the acid have failed to agree or are contra-indicated.

OBITUARY.

EDWARD HAMILTON, M.D., F.R.C.S.I.

BY the death of Dr. **HAMILTON**, which took place on 5th December, a prominent and popular member of the medical profession in Dublin has been removed. He was educated at Trinity College, where he obtained his medical degrees in 1846. He became a Fellow of the Irish College of Surgeons in 1852, and thereafter filled many important posts at the Coombe, Mercer's, Sir Patrick Dun's, and Steeven's Hospitals. He held for a time the appointment of Surgeon-in-Ordinary to the Lord Lieutenant, and was twice head of his College. Although not a voluminous writer, he contributed a good many valuable papers to the medical journals. By his death the medical profession in Ireland has lost a loyal colleague and a distinguished ornament.

MEDICAL NEWS.

THE NEW SUPERINTENDENT OF THE ROYAL INFIRMARY.

THE appointment of a successor to the late Surgeon-Major-General Lithgow, recently made by the Managers of the Royal Infirmary, has given universal satisfaction. By their selection of Colonel Warburton, C.S.I., of the Indian Medical Service, they have secured the promise of wise administration. Colonel Warburton graduated in Edinburgh in 1865, and shortly afterwards joined the Indian Medical Service, in which, from first to last, he had a distinguished career. After holding many important appointments, he was latterly Inspector-General of Civil Hospitals in the North-West Provinces and in Oudh. For his important services to the Indian Government he was gazetted a Companion of the Star of India in January, and was personally decorated by Her Majesty, in August, 1899. We desire to offer our warm congratulations to Colonel Warburton on his appointment, and heartily welcome him on assuming office.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING NOVEMBER 25, 1899; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	40°·9	[1] 89° [2] 2317°	72° 756°	2·9	28·6	52	1238	3°·1
Observed	45°·1	[1] 141° [2] 2540°	36° 730°	4·0	29·6	51	1318	3°·6
Difference	+4°·2	[1]+ 52° [2]+223°	−36° −26°	+1·1	+1·0	−1	+80	+0°·5

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING NOVEMBER, AND SINCE JANUARY 1, 1899. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1897	[1] 1,215 [2]12,171	212·7 193·5	206 2370	36·0 37·7	104 1143	18·2 18·1	297 2327	52·1 37·0	121 1369	21·2 21·7
Actual Deaths and Rate per 10,000	[1] 985 [2]12,039	172·4 191·4	222 2554	38·8 40·6	89 1124	15·6 17·8	211 1989	36·9 31·6	108 1390	18·9 22·0
Difference from Mean	[1]−230 [2]−132	−40·3 − 2·1	+16 +184	+2·8 +2·9	−15 −19	−2·6 −0·3	−86 −338	−15·2 −5·4	−13 +21	−2·3 +0·3

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1897	70 809	12·2 12·8	31 319	5·4 5·0	101 880	17·6 13·9	99 1174	17·3 18·6	50 534	8·8 8·5
Actual Deaths and Rate per 10,000	71 933	12·4 14·8	23 306	4·0 4·8	94 925	16·5 14·6	100 1179	17·5 18·68	61 648	10·7 10·3
Difference from Mean	+ 1 +124	+0·2 +2·0	− 8 −13	−1·4 −0·2	− 7 +45	−1·1 +0·7	+1 +5	+0·2 +0·08	+11 +114	+1·9 +1·8

* NOTE.—The figure [1] denotes the data for November, [2] for year to date.

The four weeks ending 25th November were most unusually warm, the mean for the East of Scotland District showing an excess of 4°·2 F. for the period. The excess of day degrees above 42° F. is in the proportion of 58·4 per cent. of the average figure, of those below that temperature 50 per cent. under the normal. The rainfall of the first two weeks was fully 2·2 in. above the usual amount, of the last fortnight 1·1 in. below, giving an excess over the whole of 1·1 in. The duration in hours of bright sunshine was practically equal to the average; the daily mean variability of temperature was half a degree above the average.

For the eleven months of the year the excess of accumulated warmth is now equal to 9·6 per cent. of the normal mean, the defect of cold 3·4 per cent. The amount of rain is exactly 1 in., and sunshine eighty hours above the average.

The warm weather of November was accompanied by a notable fall in the number of deaths as compared with that expected—a fall equal to 18·9 per cent. of that total. This was largely due to lessened respiratory mortality (28·9 per cent.), but fewer deaths also occurred from circulatory, nervous, and urinary diseases. Constitutional diseases, and among them cancer, show an increase, the latter equal to 20 per cent. Six deaths were registered as due to influenza.

For the year to date the total mortality now shows a lower figure than the mean, occasioned chiefly by the 14·5 per cent. defect in respiratory deaths, although constitutional (7·7 per cent.), digestive (15·3 per cent.), and cancerous (21·3 per cent.) causes account for increases. Again, attention may be directed to the extraordinary increase in the number of deaths from cancer, with 534 expected, 648 have occurred.

The month, therefore, warm, very wet at first, dry later, was accompanied by a lessened mortality, especially from lung diseases; the year, to date, warm and sunny by the same phenomena, along with a great increase in deaths from cancer and digestive diseases.

EDINBURGH
MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

SPRUE: A CLINICAL LECTURE DELIVERED AT ST. BARTHOLOMEW'S HOSPITAL.

By Sir LAUDER BRUNTON, M.D., LL.D., F.R.S.,
Physician to the Hospital.

GENTLEMEN,—If you go into Rahere Ward and look at two patients —one in the State bed, the other in adjoining bed—you will find two cases which resemble one another in a good many respects, although they differ very much in some most essential features. You will find that both men are lying flat on their backs, looking apathetic. They do not care to move, their faces are thin and their eyes seem to be falling into their sockets; but if you go into the cases a little more fully, and read the descriptions at the heads of the beds, you will find that the case in the State bed has lasted for years, and the case in the adjoining bed has lasted only for a few weeks. You will also observe that the case in the State bed is one where there has been little or no rise of temperature; that the temperature, indeed, has been, as a rule, subnormal, whereas in the other case the temperature has been much above the normal. The case in the State bed is one of a somewhat rare disease in this country, namely, sprue, and that in the adjoining bed is one of typhoid fever. Both those diseases are characterised more or less by diarrhœa, but the diarrhœa in both may be to a certain extent absent.

Sprue is a disease, as I have said, which is somewhat rare. Cases resembling it are exceedingly common in foreign countries, more especially in India, in Ceylon, in China, and in the Straits Settlements, but when you come to look up the literature on the subject, you will find that there is a considerable difference of opinion as to what sprue is.

There are two diseases about which authorities are disagreed, but upon which the community seem to be in accord in dividing from one another, although medical men are inclined to regard them as one. These are the diseases known popularly as "Ceylon sore mouth" and as "hill diarrhœa." Now, the reason why the populace have divided those diseases from one another is because the symptoms are more prominent in the mouth in the so-called Ceylon mouth or true sprue, and in the intestine in the Indian hill diarrhœa.

In the early stages of sprue the mouth is very sore, and very frequently also the anus is affected, although there may be at the time not much diarrhœa. In the case of the Indian hill diarrhœa, on the contrary, one may find that the mouth is not affected, while the diarrhœa is very well marked. Although, however, one is able to distinguish these two prominent symptoms, yet the two diseases may run so into one another that it is exceedingly difficult, or it may be impossible, to differentiate them, because in Ceylon sore mouth, as a rule, the soreness of the mouth is either succeeded or accompanied by diarrhœa, and in the later stages of the so-called Indian "white" or hill diarrhœa the mouth may also become affected; so that, if you take at one particular moment a case of Ceylon sore mouth or sprue, and Indian hill diarrhœa, you might be unable to say which was which. More than that, I think you will probably find, on examination of the case which we have in the wards, that although it was diagnosed when he came in as a distinct case of sprue, you would very likely diagnose it, if you were to go to it now, without any history of the case, as one of Indian hill diarrhœa, the reason being that when he came in there was a well-marked affection of the mouth, which has now subsided, although the condition of the intestines remains.

Now, in both those conditions, which, as I have mentioned, it is so hard to differentiate, we find one common characteristic in the nature of the diarrhœa—it is that, as the popular name of the Indian affection implies, the stools are white. In sprue we find that the stools have certain well-marked characteristics; they are, as a rule, liquid, white, and frothy, the froth showing that some fermentation is going on in them. They are also frequently offensive, but they may not always be so. The characteristics, then, of a well-marked case of sprue are:—(1) That the mouth is sore; (2) the anus is sore; (3) there is well-marked diarrhœa, the stools being of a liquid, white, and frothy nature.

In Indian hill diarrhœa the same character of the motions obtains, but you do not find the condition of the tongue, the mouth, and the anus to the same extent. The consequence of such an affection is necessarily malnutrition of the patient. The patient's body loses weight, his muscles lose strength, he is disinclined to move, as you will see from the patient in Rahere Ward. He looks shrunken, and, more than that, his mental and nervous systems seem to fail to a certain extent also. He is rather apathetic, does not care to move, does not like to be tormented with questions, and possibly, if you do trouble him much with questions, you may find that he is just a little irritable. However, all these are, I think, only secondary to the malnutrition, and as patients who suffer from this disease begin to recover, both their bodily and mental condition improves.

There are some other conditions in which this whiteness of the motions is found, which has been a very great stumbling-block to many people, who have been quite unable to explain the whiteness. In the case of most of them, the whiteness is due, not to absence of bile, as one would expect, but to the presence of undigested fat. You may get complete absence of bile where there is no diarrhœa. One of the most remarkable instances of this sort that I have ever seen was in a patient whom I saw just ten years ago. He had been a good long while in Calcutta, and suffered from ague. The first symptom that he noticed, in January 1885, was absence of bile from the motions, although at that time there was no diarrhœa—the diarrhœa first making its appearance in May 1885. He got very much worse, very weak, and came to this country, where I saw him in consultation with Dr. Lime Stevens. He was then passing motions of a very peculiar character. They were as white as arrowroot, but they were tougher than ordinary formed motions, so much so, that instead of breaking into pieces they fell into a very peculiar shape. They really looked like a snake coiled up, with the head projecting, just as if ready to strike. I should say that this gentleman was at the time upon milk diet, and the apparent absence of bile from the motions sorely puzzled me, because there was no jaundice of the skin, no darkness of colour in the urine. I thought that the liver in some extraordinary way must have had its function abolished, but I got an analysis made of the fæces by Dr. Sidney Martin, who found that the liver was doing its work, and that the motions did contain bile, although in small quantities. Biliverdine was present in an unaltered form, though only an indication of biliary acids could be obtained. If we had found the opposite of that, namely, if we had ascertained that bile acids were abundant, but that only a trace of colouring matter was present, we would not have wondered that the motions were white, but it was not so. The bile acids seemed to be diminished, but the bile pigment was present in an unaltered form. The reason of the motions being so white was that the fat in the milk was not digested, and therefore it appeared in the motions. In the case I have just alluded to, it would seem, then, that the starting point of the disease was rather in the absorption from the digestion of fat, and that this occurred four months before there was any indication of diarrhœa. This is, I think, interesting in regard to the pathology of the disease, which we shall presently have to consider, because in most cases the pathology of the disease is said to depend upon the alteration in the intestine. This, no doubt, is a very important point, but I think that the want of change in the fat points also to some extent to an alteration in the pancreas.

On looking at the symptoms more closely, we find that the changes in the mouth are apparently of an aphthous nature; that you see on the tongue, first of all, a certain amount of redness and congestion. Then this redness becomes patchy, and is found to surround little vesicles. These burst and then ulcerate, and these ulcerative portions may run into one another; in this way more or less biggish ulcers may appear upon the tongue, and in many cases they are seen on the outside of the lips and inside of the cheeks. Thus we get what is known as the Ceylon sore mouth. The mouth is so exceedingly tender that the patients cannot bear to chew much, nor can they bear anything that is in the least irritating. For example, they cannot touch even diluted spirit or wine, on account of the soreness it causes. Pepper, condiments of all sorts, and even salt, they are obliged to go without. This tenderness of the mouth is not limited to the mouth and tongue. It goes apparently down the œsophagus, so that on taking anything irritating or hot they feel the pain or burning right down to the stomach. Once it is in the stomach they do not complain so much of pain, but they may have pain more or less over the stomach and abdomen. Then again, coming to the next region supplied by spinal nerves—to the anus—they complain of pain there. The changes that are noticed in the mouth, in the œsophagus, and in the intestine, are first of all apparently denudation of epithelium. The mouth becomes more or less denuded of epithelium, as is shown in one of the sections which Dr. Sandiland has kindly lent me, and which I show you under the microscope; you will see that the ordinary epithelium is almost entirely absent, or represented only by one layer of epithelial cells. The same denudation of epithelium appears to occur in the gullet, but does not seem to occur in the stomach, at least to any great extent. In the small intestine it is much found, and there you will also find a very peculiar condition. This bared intestine is covered with a layer of mucus. The whole intestine, moreover, seems exceedingly thin, almost translucent. I remember being very much struck by a case which I saw many years ago, and which I did not diagnose. I suppose it is now nearly twenty years ago, and at that time very little was written about sprue. It was the case of a captain who had spent many years in the China seas. He had suffered from dysentery, and returned home and settled down in a small house near Mitcham Junction. He had chronic diarrhœa, with a good deal of pain in his abdomen. I tried all sorts of things, but the diarrhœa would not yield, and finally he died of exhaustion. My diagnosis was that the case was one of chronic dysentery—diarrhœa consequent upon an acute dysentery—and that probably I should find in the intestine a number of ulcers. To my astonishment I found that there were no ulcers in the intestine, and when I took the small intestine out, it looked like a bit of bladder. It was so thin, so translucent, and the surface of it looked as if the whole thing had been shaved with a razor until all the villi had been taken off, and it had thus been rendered quite transparent—in fact, as if it had been prepared in imitation of a bit of parchment for writing upon. Now, it is this bare condition of the intestine, of the tongue and of the œsophagus, this denudation of epithelium, which has led Dr. Thin to give the name of Psilosis linguæ to it. This term, as you see, is the expression of an acute disease, and intimates that Dr. Thin considers this sprue to be entirely distinct from hill diarrhœa; but it is exceedingly difficult to be quite certain of the diagnosis in particular stages of the disease, and you can only diagnose them by paying attention to those points which are prominent in the ordinary names given to diseases by the lay public, namely, the soreness of the mouth in the case of sprue, and the absence of this in the case of hill diarrhœa. We know diarrhœa is a common symptom in both.

The prognosis in both diseases is bad if they are left alone. The patient is very apt to get weaker and weaker, and finally to die. Nor is the fatal issue, as in the case of my first patient, to be averted by the use of drugs, unless you put the patient on a particular diet at the same time. The diet, which is a *sine qua non* in treating either hill diarrhœa or sprue, is an entirely milk one. It is the same diet that we use in cases of typhoid fever; milk, and nothing but milk. The next question comes to be, how much are you to get the patient to take? Well, the answer is, get him to take as much as ever he can. A large proportion of the milk will almost certainly pass unabsorbed through the intestine, more especially will the fat not be absorbed. The sugar of milk and the proteids are absorbed to a great extent, but the fats are not. By giving him a large quantity of milk you will probably be able not only to maintain his strength, but to increase it, and after a certain length of time the patient will get well. That they do recover I know, because I have here the notes of another case where the symptoms were well marked, and where the patient, after being put upon a milk diet for a length of time, became first of all greatly improved, and now I hear is completely well, although he is a somewhat elderly man. But just as in cases of typhoid fever, patients sometimes cannot take milk, or milk is insufficient, so it is in cases of sprue. What is to be done in such cases? Well, if you cannot get enough milk down, you may try the effect of giving along with it some beef juice, or you may try the effect of putting the patient entirely upon meat juice. This treatment was actually tried, with benefit, in the case that we have here; the notes of which I shall presently read.

In addition to this, however, you may give them a medicine which is very useful, and in the case that I mentioned a little while ago, where the bowels were not very loose, but where we had that peculiar form of motion, the medicine that was most useful was a preparation of bismuth, with the addition of some cannabis indica. This addition was made to it by Dr. Maconnel of Calcutta, whom I saw in consultation in regard to the case. Dr. Maconnel, who has unfortunately since died, told me that this was a formula that he had used very much in the treatment of hill diarrhœa in India, and had found it, upon the whole, to be one of the most successful. I will just write it down, because many of you may go into the army and go out to India, and may have to treat such cases. The first thing you have to do is to put your patient upon a milk diet. If he cannot take very much milk, put him to bed, so that you take nothing out of him, and put everything into him. If he can take a lot of milk, you may possibly allow him to go about; and in one case which Dr. Thin treated, and which I saw on one occasion during his absence from town, the patient was on a milk diet absolutely for three months. In that time he laid on flesh, although he was attending to his duties as a director in a city company several times a week. The prescription I have referred to is:—

℞	Bismuth. carb.	gr. x.
	Sodii bicarb.	gr. x.
	Tinct. cannabis ind.	minims v.
	Mucilag. tragacanth	ʒi.
	Aq. cinnamon ad	℥i.

You must be careful not to forget to add the tragacanth or acacia, for cannabis indica, as you know, owes its activity to a resin, and when you mix the tincture with water, as you will do in making up a mixture, the resin will be precipitated. This mixture may be given every three or four hours, or even oftener.

In most of the cases we have been discussing, the liver is not found to be much enlarged, but, if anything, it has a tendency to be small. This is, however, not always the case,—at least, not in hill diarrhœa. A man, æt. 35, consulted me in July 1888. He had been out in Afghanistan eight years before he came to me, was attacked with diarrhœa in 1880, and had suffered more or less from it for the last eight years. When I saw him he had been stationed for a couple of weeks at Colchester, and had been suffering very much from a recurrence of the diarrhœa. In his case there was a slight enlargement of the liver. I put him upon this mixture, and I also gave him some blue pills to try and act upon the liver, because it seemed to me that if there was any congestion of the liver it would tend to keep up the diarrhœa. He was not getting on quite satisfactorily, and I said to him, "There is one thing I should like to do, but I do not care to do it without a consultation." It seems so very absurd to give a man who is suffering from chronic diarrhœa, lasting several years, a violent purgative, and yet I said, "I think, before we can do much, we will have to unload your liver; but before we do so, I think we had better see Sir Joseph Fayrer." I took him to Sir Joseph, who quite concurred in my view, and said, "It is the best thing you can do." Sir Joseph prescribed that he should have a blue pill every other night, a drachm of sulphate of magnesia, a drachm of sulphate of soda, ten minims of dilute sulphuric acid, two grains of sulphate of quinine, and an ounce of compound infusion of gentian, every morning at seven o'clock, after the pill. Well, this cleared him out very thoroughly. The addition of the quinine and the sulphate of iron to the sulphate of magnesia and soda seems to make them much more efficacious, and the consequence was that the patient's liver went down very quickly, and after the liver had been disgorged, we found that the medicine he had been taking before began to act, and in a short time the patient got perfectly well.

I will shortly read the notes of the case which we have now in Rahere, so that you may be able to look at it with some interest.

CASE 1.—The man, æt. 35, had a long field-day in April 1896, in the course of which his company passed some stinking cesspools. From that day up to November 1896 he had irregular diarrhœa, but the stools were dark in colour; he had no soreness of the mouth, and no dyspepsia. About 17th November his regiment moved to Secunderabad, where he at once began to suffer from great soreness of the mouth. It lasted for about three days, and then he began to suffer from a fresh attack of diarrhœa. The stools were now for the first time white and frothy. With the diarrhœa, the patient had great pain in the epigastrium and over the lower end of the sternum. His abdomen became swollen; he had attacks of vomiting, and acid burning eructations rose at different times into his mouth. This is not quite the typical beginning of sprue, because in many instances the disease comes on very insidiously, whereas here it came on rather sharply. It did not come on when he reached Secunderabad, but really while he was on the way from Bellary to that station. The condition of the mouth quickly improved, and all the soreness had gone in seven days from the onset of the attack. From 9th November the diarrhœa continued up to present date. At times he was passing twenty motions a day. On 25th March 1898, he was admitted into Netley Hospital, where he improved on a diet of milk, eggs, and brandy. He came into St. Bartholomew's in May, and at that time the surface of the tongue, with the exception of a strip in the centre of the dorsum, was bright red, smooth, shiny, and moist. The bright red colour, the smoothness and shinyness, along with the character of the motion, would at first incline one to regard the case as being one of sprue, but if you look at his tongue now, you will notice that it has not got this shaved appearance; the papillæ are not so large as they would normally be. The tongue is somewhat smoother than it ought to be. A central strip, about an inch in breadth, is covered with a dirty thin fur, and presents normal filiform papillæ, which elsewhere are absent. The buccal surface of the gums of the lower jaw and mucous membrane of the lower lip are bright red, moist, and shiny. On the lower lip, opposite the second incisor tooth on the right side, is a white patch of coagulated inflammatory exudation about the size of a pea. The white patch is surrounded by an area of deep crimson. The pillars of the fauces and the tonsils are injected and somewhat swollen. They show no ulceration. The liver was unchanged in size, and cardiac dulness is somewhat masked by the stomach resonance; it commences at the fourth rib. The abdomen is distended, soft, and tympanic all over.

That was practically the whole of the condition of the patient at the time of admission, and you will see that there is very little difference now.

The only point I wish now to mention is as to the treatment of the sore mouth and the soreness of the anus. The sore mouth may be treated with a good many different things. One is rather tempted sometimes to give some of those little tabloids, consisting of compressed chloride of ammonia, or chlorate of potash, but the difficulty about that is, that if you put one of them into the mouth it hurts too much, because, as it is dissolved by the saliva, the solution thus made is too strong. But you may use a diluted solution of chlorate of potash or borax, say five grains to the ounce, quite easily, and this sometimes relieves the patients very much. A dilute solution of bicarbonate of soda seems to help a good deal, because the bicarbonate of soda neutralises any acid that may be present in the mouth, and lessens the soreness of the tongue. Lime water also may be used as a mouth wash. The soreness of the anus may be relieved, or perhaps entirely removed, by the use of various ointments,—an ointment containing bismuth, for example, especially bismuth made up with lanoline. I do not know what the composition of homocœa is, but one of my patients, who came from Ceylon, told me that he found this preparation almost invariably relieved the soreness which occurred in the disease. If you find that the bismuth alone is not going to act, you may then put in a small proportion, say one part in twenty, of calomel ointment, or else of unguentum hydrargyri ammoniati, into the mixture of oxide of zinc and lanoline. There is one point I have forgotten to mention in regard to the non-absorption of the fat. This might be due in great measure to the absence of the bile, but the absence of the colour in the case I referred to, Mr. M., where the stools began to get white three months before diarrhœa came on, seemed to point rather to some obstruction of the pancreas, and the reason that one is inclined to attach this condition of pale stools to alteration in the pancreas is, that some years ago Dr. Walker of Peterborough read at the Medico-Chirurgical Society notes of a case of white stools lasting for several years, and with no apparent impairment of the patient's health, but where after death the pancreatic duct was found to be completely obstructed, so that it would seem that in such a case as Mr. M.'s it was not the liver that was at fault, but that the pancreas had struck work, and for some reason or another the secretion had not been poured out into the duct. In consequence of this idea, some maltine was given to the patient, in order to supply a dietetic ferment, and on this treatment he improved more than upon the milk alone. In the case at present under treatment we are giving milk with liquor pancreaticus, with the idea of trying to supply a ferment which may possibly be absent.

In post-mortem examination it has been found that the pancreas is also somewhat affected, and that there is a great deal of increase in fibrous tissue, and very often vacuolation and disintegration of the cells forming the secreting structure of the pancreas. In the microscopic sections you will find first of all absence of epithelium in the tongue, and a section of the ileum shows thinness of both the muscular coats, with degenerative changes in the muscular cells. In both the ileum and in the tongue this denudation of epithelium is observed, and on the ileum one generally finds also a thick coat of mucus all over the surface.

INJURIES AND DISEASES OF THE CONJUNCTIVA.[1]

BY A. MAITLAND RAMSAY, M.D., *Ophthalmic Surgeon, Glasgow Royal Infirmary, etc.*

As the eyes occupy a prominent and exposed position upon the face, nature has done much to protect them from injury. Their rounded shape enables them to be moved by their muscles freely in all directions in the cavity of the orbit, while they rest upon and are surrounded by a quantity of fat, which acts like an elastic cushion, and deprives direct violence of much of its force. The margins of the orbital cavity, especially the overhanging frontal border, with its projecting fringe of eyebrows, also afford a strong protection, while the busy winking of the eyelids prevents the slightest particle of dust from adhering to the cornea, and so keeps its surface constantly clear and bright. When this unconscious winking does not take place, as in paralysis of the facial nerve, the surface of the cornea rapidly becomes dull and dry, and even ulcerates, as a result of constant exposure. Should any danger threaten, the eyelids are instinctively closed, and the eyeball is at the same time turned upwards, so that the cornea may be specially well protected behind the upper eyelid. When any foreign body, such as a particle of dust or a small fly, manages to evade the watchful guard of the lids, and get inside, the nervous apparatus immediately comes to the rescue and sets to work to bring about the expulsion of the intruder. The fifth cranial nerve, which endows the conjunctiva and cornea with sensibility, supplies also the lachrymal gland, and as soon as the conjunctiva is irritated by the presence of a foreign substance a copious flow of tears results at once by reflex action, and the irritant is washed towards the inner canthus, and there ejected. Rubbing the eye—and this is what everyone in such circumstances feels inclined to do—seriously interferes with this process, because the foreign body is either driven to take refuge beneath the upper eyelid, or, if it possess sharp edges, to embed itself in the cornea; and so it is better to exercise a little patience and keep the eyelids gently closed for a brief space, when nature will, as a rule, bring matters right in her own way. The reflex flow of tears may be promoted by rubbing the *other* eye, and thus the patient can, if he please, relieve his feelings without doing harm.

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[1] A post-graduate lecture delivered at the Ophthalmic Institution, Glasgow, 14th November 1899.

In many cases the foreign body becomes lodged beneath the upper eyelid, and in order to effect its removal it is necessary to evert the lid. This is easily done if gone about in the right way. Have the patient seated in a good light, and ask him to look downwards; then grasp the eyelashes with the thumb and index-finger of the left hand, and pull the eyelid forwards and downwards; lay a probe or the edge of a coin along the upper margin of the tarsal cartilage, turn the eyelid upwards, and the operation is complete. When a patient complains that he has received an injury to his eye, his doctor should invariably make a careful examination of the conjunctival surface of the upper lid: to overlook a foreign body in this position is certain not only to cause much unnecessary pain to the injured person, but also to bring a great deal of discredit on the medical man concerned. Among farm labourers, particles of straw or chaff frequently become so deeply lodged in the upper conjunctival *cul-de-sac*, that they may be hidden from view even when the upper eyelid is everted. It is necessary, therefore, if it be suspected that a foreign body is present, not only to evert the eyelid, but also to carefully explore the *cul-de-sac* with a small probe. It is all the more needful to bear this in mind, because, though the presence of the smallest particle of dust within the eye usually gives rise to intolerable uneasiness, yet the presence of larger bodies may be tolerated for weeks in the loose folds of the superior conjunctival *cul-de-sac*, without their presence being indicated by more than slight inflammatory symptoms accompanied by swelling of the conjunctiva. Such an inflammation, however, is not at all influenced by the usual remedies, and only subsides after the removal of the exciting cause.

Particles of dust or other débris, blown into the eye by the wind, are usually found lying loosely upon the conjunctiva, and are, as a rule, readily removable with the point of a toothpick, a camel-hair brush, or the edge of a small spud. Should the foreign body, on the other hand, be embedded in the substance of the cornea or of the conjunctiva, the difficulty of its removal is directly proportionate to the depth to which it has penetrated. Substances of this class most frequently met with are what workmen call "fires," *i.e.* minute particles of metal, which, struck off from tools at a white heat, are projected against the eye with such force that they either cut or burn their way into the tissues, where they become fixed. The difficulty of dislodging them is usually greatly increased by the irritation and injury to the eye caused by previous unsuccessful attempts at removal. Many examples might be given of the destruction of corneal tissue arising from the vigorous but futile efforts of a workman to extract a "fire" from the eye of his neighbour with the point of a penknife. The "fire" itself will do less damage to the eye than do those rough and persistent attempts. If the patient does not present himself to the surgeon until two or three days after the injury has been received, and if he has not allowed any one to meddle with his eye in the interval, it will be found that the embedded substance is surrounded by a whitish ring of softened corneal epithelium, which a very slight touch with a spud will cause to separate from the parts beneath. In fact, if the sufferer had waited a day or two longer, the probability is that nature alone would have brought about the same result, by casting off the softened corneal tissue, foreign body and all, leaving a breach of surface of greater or less depth. The sooner, however, such intruders are skilfully removed the better, and the most convenient instrument to use is either a cataract needle or a small gouge. The instillation of a few drops of a two per cent. solution of cocaine renders the operation perfectly free from pain, and in cases where the foreign body is very minute a drop of solution of fluorescin, by colouring the abraded epithelium green, is a great help in diagnosis. Before removal from the cornea is attempted, always seat the patient in a good light, with his head well supported by the back of a chair, or, preferably, by the hands of an assistant. Separate the eyelids by the thumb and index-finger of the left hand, and press slightly backwards, so as to fix the eyeball; then pass the needle or gouge behind the foreign body, and lift it from the cornea. Should it have penetrated deeply into the substance of the cornea, and there be danger of pushing it backwards into the eye, a second and broader needle should be passed into the anterior chamber behind it, and with this extra support removal is usually a matter of no great difficulty. The brownish stain which often remains after the operation, ought to be carefully scraped away, so that the healing process may be hastened. When the substance gets embedded in the conjunctiva, the best way to effect its removal is to grasp it with a pair of forceps, and, with a pair of curved scissors, to cut out the piece of conjunctiva to which it is adherent.

Removal is in all cases followed by an immediate sense of relief, and, as a rule, nothing more requires to be done, except to bathe the eye with some antiseptic lotion, and, if pain continues, to apply a little ointment of cocaine and vaseline, and adjust a compress and bandage, which should be worn until all signs of irritation have passed away. When, however, owing to long contact with the foreign body, or to rough handling in attempts at its removal, the broken corneal surface is slow to heal, it should be lightly dusted with equal parts of precipitated iodoform and boracic acid in very fine powder—such treatment stimulating the healing process, and counteracting as far as possible any tendency to suppuration. In these cases, atropine, 1 per cent. solution of the sulphate, should always be instilled, and the instillation repeated as often as is necessary to keep the pupil fully dilated. Acetate of lead should never be used. Lead lotions have enjoyed a well-deserved popularity in the treatment of conjunctival inflammations, but whenever there is a breach of surface the acetate is decomposed, and a white precipitate is deposited. If such deposit take place on the cornea, a dense white glaring opacity is the result, and the patient's vision is permanently impaired.

Wounds of the conjunctiva usually heal rapidly, and rarely require to be sutured. It is sufficient to keep the part thoroughly cleansed with a weak antiseptic solution, and to protect it by means of a compress and bandage. After healing has taken place, a fungus granulation occasionally develops at the site of the injury, and it is necessary to snip this off with a pair of scissors.

A blow upon the eye at once induces rapid swelling of the lids and the surrounding parts, all of which speedily become discoloured from effusion of blood. The appearances presented are those commonly designated as a "black eye." In the majority of cases there is also subconjunctival ecchymosis, which varies in degree according to the severity of the injury. This may be limited to the spot where the eyeball was struck, or, as sometimes happens, may completely cover the sclerotic, and then the conjunctiva projects, and appears like a red collar encircling the cornea. The effused blood forms a clot, visible through the transparent conjunctiva, and bounded in front by the corneal limbus. Now and then, however, these limits are overstepped, and blood finds its way for a short distance into the substance of the cornea. It always more or less completely hides the sclerotic, and this changed appearance of the eyeball is at once noticed by the patient, and usually causes him much anxiety. When subconjunctival ecchymosis occurs immediately after an accident, it is of very little significance, but should it not make its appearance till after a lapse of several days, the prognosis is very serious, because it is then one of the most trustworthy indications of fracture through the anterior fossa of the skull. This sign is therefore of great value as indicating a grave condition, which may be followed by death; so that it is always very important in every case of injury to the head to note whether subconjunctival ecchymosis be present, and to inquire whether it appeared immediately after the accident or not for several days. In old people, whose blood vessels have brittle walls, subconjunctival ecchymosis may occur spontaneously during a violent attack of coughing, sneezing, or vomiting, and in children it is by no means unfrequent during whooping-cough. In the latter case it is not as a rule of any importance, but in the former it is wise always to examine the urine for sugar and albumin before giving any opinion as to the significance of the hæmorrhage. Subconjunctival ecchymoses are also met with in diseases accompanied by grave changes in the blood, *e.g.* purpura and scurvy.

Gradually the clot becomes absorbed, passing through varying shades of brown and green and yellow until the sclerotic again becomes visible. The time required for the disappearance of the blood varies from a few days to several weeks, but in all cases in which the hæmorrhage has been extensive, a yellowish staining of the white of the eye remains for a much longer time. After a slight blow, the patient does not as a rule complain of anything except the disfigurement produced by the ecchymosis, but when the contusion has been severe, there is always more or less dimness of vision, and the pupil, which at first is somewhat contracted, does not readily dilate under the influence of atropine. This drug may have to be instilled several times before full dilatation is produced, and the pupil often expands irregularly, assuming an oval shape before becoming round. The dimness of sight is, unless the eyeball has received some structural damage, always transitory, and often of very short duration, and is supposed to be due to shock sustained by the retina at the time of the accident. The lowered visual acuity is sometimes due to a temporary astigmatism, and there may be no change visible on ophthalmoscopic examination, though occasionally the optic disc is seen to be congested, and there is a hazy clouded appearance over the fundus oculi, especially round the macular region. Sometimes there is slight hæmorrhage into the macula, giving rise to a very marked central defect in the field of vision. When the injury has been so severe as to produce fracture of the bones at the inner side of the orbit, communication is opened up with the frontal and ethmoidal sinuses, and air is thereby allowed to escape into the surrounding cellular tissue. This is known as emphysema of the eyelid. It is usually accompanied by epistaxis, and the soft swelling is readily distinguished by its crackling to the touch, and increasing rapidly in size when the patient blows his nose.

Subconjunctival ecchymoses require no treatment whatever, as they gradually become absorbed. It is usual, however, to prescribe lotions containing arnica, lead, or witch hazel, but these rather give comfort to the patient than possess any active virtue in hastening absorption. In emphysema a compress and bandage should be carefully applied, and the patient warned not to blow his nose, lest by so doing he drives fresh air into the tissues.

Of all injuries to the conjunctiva, none are more disastrous in their results than burns, especially those due to the action of chemical irritants, of which quicklime and sulphuric acid are two of the most common. In all such cases the prognosis must be very guarded, as the action of the chemical extends far beyond its point of application, and what seems at first sight only to have caused a greyish haze over a part of the surface of the cornea, will probably, by the end of a fortnight, have brought about the total destruction of that membrane, and the consequent extinction of vision.

In all cases of burns or scalds of the eyeball the general symptoms are the same, and their severity depends upon the nature of the irritant, the length of time it has remained in contact with the eye, and the extent of the structural injury it has produced. After a burn, from whatever cause, the pain in the eye is very severe, and the inflammatory reaction is rapid and violent. The eyelids are usually injured; but whether or not, they quickly assume a dusky red colour, and become so swollen that the eyeball can be seen only with difficulty. There is chemosis of the ocular and palpebral portions of the conjunctiva, and the cornea becomes hazy over greater or less part of its surface. In less than twenty-four hours, the burnt surfaces are clearly mapped out and are separated from the other tissues by a well-defined zone, in which the inflammatory reaction, the result of the injury, is most acute. Pus now begins to be discharged, and the tissues killed by the burn are separated as sloughs, after which recovery more or less complete commences, if the injury to the eye has not been too great. Should the case, however, be severe, the inflammatory process goes on, the conjunctiva becomes thickened and fleshy, the cornea suppurates and bursts, and the eye ultimately shrivels. In cases where the cornea does not give way and the shape of the eyeball is preserved, a dense leucoma remains, or from the thinning of the parts, due to the separation of the sloughs, the cornea bulges forwards, and a staphylomatous projection is produced. In this connection it may be noted that very severe causes do not always produce proportionately severe results. When molten metal, for instance, gets into the eye, it might be expected to, and very often does, cause serious structural damage, and yet, on the other hand, there are cases where the injury is remarkably slight. The explanation is that, on the first entrance of the metal, the great heat causes the moisture in the eye to pass into what physicists call its "spheroidal state," and the spheroids of water, acting as a non-conductor, protect the eye from injury.

In all severe burns, both ocular and palpebral mucous membranes are destroyed, and the raw surfaces left adhere in the process of healing, so that the eyelid becomes firmly fixed to the eyeball. This condition, which is known as symblepharon, will, no matter how much care has been taken to prevent it, certainly occur in every case where the retrotarsal fold of conjunctiva has been destroyed, and where it is extensive, causes not only interference with vision, but intolerable discomfort from the sense of dragging which it produces. Although many operations have been devised for its relief, symblepharon is usually so little amenable to treatment, that, where it is extensive, only partial success can be hoped for even after the most approved operative procedure.

After a burn the healing process is slow. The vitality of the tissues has been lowered by the injury, and as the cicatrix goes on contracting, the eyelids may either become inverted so that the eyelashes rub upon the eyeball, or else they may be everted, with the result that the face is frightfully disfigured, and the original damage to the cornea is augmented by the constant exposure of the ball.

Burns of the globe are treated in the same way as acute suppurative inflammation, and in dealing with injuries from chemical irritants, special precautions have to be taken from the very first. In the case of quicklime, the severity of the burn is due to the fact that the lime usually remains for a considerable time in contact with the tissues, and its powerful escharotic action has thus time to take full effect. The slightest particle of it entering the eye gives rise to the most intense irritation, leading to spasmodic closure of the eyelids and a copious secretion of tears —a combination of circumstances which is, as we have seen, most favourable in ordinary cases for the extrusion of a foreign body, but which in this case is most unfortunate, because by the firm closure of the eyelids the lime is pressed against the eyeball, while the tears slake any portion of lime which is yet unslaked, and the heat consequently evolved increases the rapidity of the work of destruction. When, therefore, unslaked lime has caused the injury, any particles remaining should be at once removed, and after the eyelids have been everted, the conjunctiva should be thoroughly douched by a stream of cold water, or by a weak acid solution, if this be available. On the theory that sugar will dissolve the lime, and so cause its thorough removal, M. Gosselin has recommended that the eye should be douched with a solution of sugar; but the rapidity with which the lime destroys the tissues is so great, that the work of destruction is usually completed before the surgeon sees the case, and as the solvent effect of saccharine solutions on slaked lime is very gradual, all that can really be done is to make sure that the conjunctival sac is thoroughly freed from any of the particles which may be adhering to it. After a burn from an acid, an alkaline douche is of course preferable, but in all cases, after the eye has been washed, castor oil and cocaine should be applied to the conjunctiva, an iced compress laid over the closed eyelids, and the patient put to bed. In order to combat the inflammatory reaction which is sure to follow, the ice-cold compress should be continued, and saline purgatives administered, while the pain must be subdued by the application of leeches, and by either the administration of full doses of opium, or the hypodermic injection of morphia in the temple. The use of these anodynes has the additional advantage of inducing sleep and soothing the nervous system generally. After a few days, warm applications are usually found to be more grateful to the patient than the iced compress, and the sedative effect of these fomentations may be increased by poppy heads and chamomile flowers, while much additional relief may be obtained by smearing the eyelids, forehead, and temples with a mixture of extract of belladonna and glycerine. When the acute symptoms have subsided and the sloughs have begun to separate, antiseptic lotions should be used, and much benefit is often obtained from the daily instillation of a weak solution of nitrate of silver. Any iritic complications must be treated by the judicious use of atropine; but in this connection it may be mentioned that, as burns of the corneo-scleral margin are apt to give rise to glaucomatous symptoms, the use of the atropine must be at once stopped if the patient complains of increased pain with sudden dimness of vision, and an endeavour must be made to reduce the increased tension of the eyeball by the energetic use of eserine or pilocarpine. During the cicatricial stage the greatest attention must be devoted to overcoming the tendency to symblepharon. The adhesions must be diligently broken down with a probe, and the eyelids drawn away from the eyeball, so as to permit a layer of vaseline to be instilled between the two raw surfaces. Symblepharon will, however, in bad cases, form in spite of all one's efforts, and although much ingenuity has been displayed in devising mechanical apparatus to keep the lid separated from the eyeball, these, as a rule, fail to accomplish the object for which they are intended, because, as cicatrisation progresses, there is none of them that does not get displaced, and the adhesions form again and again, with a pertinacity which is most vexatious.

The conjunctiva is, when healthy, perfectly transparent, for the blood vessels and lymphatics with which it is abundantly supplied are so small, that, with one or two exceptions, they are invisible, and in no way modify the whiteness of the underlying sclerotic. If, however, a particle of dust, or any other irritant, enter the conjunctival sac, the capillaries become at once congested, and, in proportion to the amount of the hyperæmia, the "white of the eye" is concealed by an intricate meshwork of injected blood vessels. Redness of the "white of the eye" is therefore one of the earliest, as well as one of the most characteristic, signs of conjunctival inflammation; though, of course, every eye that is red is not to be regarded as suffering from conjunctivitis.

In general venous congestion there is usually injection of the larger conjunctival vessels, while in anæmia abnormal pallor of the conjunctiva is always present. In jaundice, yellowness of the conjunctiva is one of the earliest as well as one of the most constant signs.

Careful examination will, however, readily distinguish injection of the superficial or conjunctival vessels from hyperæmia of those which are more deeply placed. In the former condition the redness is of a brick-red tint, and is most intense in the region of the retrotarsal fold. The congested vessels are comparatively large and tortuous, and are arranged in the form of a network freely movable with the ocular conjunctiva. Pressure will, for the moment, drive the blood away and expose the sclerotic. In the latter condition, on the other hand, where the deeper structures—*e.g.* the cornea or iris—are attacked, the redness is rose-pink in hue, and forms a zone round the cornea. The distended vessels are minute and hair-like, and lie in the episcleral tissue under cover of the conjunctiva, pressure upon which does not materially diminish the amount of vascularity; moreover, the pupil does not react promptly to the stimulus of light, and the pain complained of is characteristically throbbing, markedly nocturnal, and usually circumorbital. In some instances superficial and deep injection coexist, but as a rule it is easy to determine by careful inspection which of the two predominates.

From the exposed position of the eye upon the face, the conjunctiva is constantly exposed to noxious influences, and must, in consequence, necessarily suffer frequently from inflammation. The forms that the conjunctivitis may assume, depend upon three different factors:—(1) the part of the conjunctiva primarily affected; (2) the exciting cause; and (3) the constitution of the patient.

1. *The part of the conjunctiva primarily affected.*—In their normal histological characters, the palpebral conjunctiva, the bulbar conjunctiva, and the retrotarsal fold differ considerably the one from the other, and these differences become much more pronounced during inflammation.

2. *The exciting cause.*—Of recent years much attention has been given to the study of the bacteriology of conjunctival diseases, and specific micro-organisms have been found to be invariably associated with certain inflammations. It is not possible, however, in the light of our present knowledge, to classify all forms of conjunctivitis on this basis alone. All the ordinary bacteria have been found present in the healthy conjunctival sac, but only a few of them have been proved to be pathogenic. That their presence is not more harmful, is probably

due to the bactericidal action of the tears, which, when normal, *i.e.* slightly alkaline in reaction, seem capable of neutralising the virulence of many micro-organisms. When, on the contrary, the reaction of the tears is acid, the conjunctiva is much more readily attacked by microbes.

3. *The constitution of the patient.*—Diathesis undoubtedly plays an important part not only in influencing the course of the inflammation, but also in determining the particular form it may assume. For example, conjunctivitis occurring in a strumous patient is usually characterised by the presence of pustules or phlyctens on the bulbar conjunctiva; whereas in a gouty subject the inflammation is limited for the most part to the palpebral conjunctiva, and is characterised by the occurrence of active hyperæmia, which is transient but recurrent, is at times markedly periodic, and is accompanied by chalky deposits in the Meibomian glands.

Active hyperæmia is the starting-point of all conjunctival inflammations. It is seen in its simplest form in the irritation produced by a foreign body, *e.g.* a "fire" on the cornea. The eye is red and waters, especially when exposed to the light, and winking causes a sharp pain; but at this stage there is no discharge, and all the symptoms speedily disappear after the exciting cause has been removed. When, however, the irritant remains, the conjunctivitis passes the stage of simple hyperæmia, discharge and other inflammatory products are developed, and the special form which the inflammation will assume depends largely upon the behaviour of these products.

1. If the palpebral conjunctiva be primarily affected, the inflammation will be accompanied by discharge, and also by hypertrophy of the papillæ found there under normal conditions. The nature of the discharge is determined by the exciting cause, *e.g.* if the special etiological factor in the case be the bacillus of Weeks or the diplococcus of Morax and Axenfeld, the discharge will be muco-purulent or catarrhal; if the gonococcus, then it will be distinctly purulent or blennorrhagic; if the Klebs-Löffler bacillus, then it will be so plastic and fibrinous as to coagulate on the surface, forming a false membrane—*croupous*—and in its most severe forms coagulation takes place within the tissues, causing necrosis of the conjunctiva—*diphtheritic.* Diphtheria of the eyelids is rarely primary, as it usually reaches the eye by spreading along the tear passages from the naso-pharynx. It most frequently attacks children between the second and the eighth year, and the prognosis is always serious, not only as regards the eye, but also with respect to the life of the patient. In the worst cases the staphylococcus and streptococcus are found, in addition to the Klebs-Lœffler bacillus. The eyelids are swollen, infiltrated, and brawny. They cannot be everted, and in very severe cases it is hardly possible to open the palpebral fissure wide enough to see

the eyeball. A false membrane, of ashy-grey colour, covers more or less completely the congested livid-red conjunctiva, and is so incorporated with the lids that it is separated from them only with difficulty, leaving the surface raw and bleeding. The membrane forms again with extraordinary rapidity. It spreads from the lids to the globe, and in malignant cases the destruction of the cornea is almost inevitable, and in addition, as a result of cicatricial contraction, the lids adhere to the eyeball, and give rise to trichiasis and entropion. It is of the utmost importance, therefore, to recognise the disease at the earliest possible moment, and, whenever an accurate diagnosis has been arrived at, antitoxin should be injected. The lids themselves must be kept clean by the free use of a warm solution of permanganate of potassium or sulphate of quinine, but nitrate of silver, so potent for good in purulent conjunctivitis, ought not to be employed, even in weak solution, until the false membrane has separated, and its use must be discontinued at once if the exudation again become plastic.

After the subsidence of any of these forms of inflammation, the papillæ which are the distinctive histological features of the palpebral conjunctiva, shrink in ordinary circumstances to their normal dimensions. Under certain conditions of health, however, and with insanitary surroundings, and probably owing to the presence of a specific micro-organism, they continue to increase in size, and the conjunctiva gets studded with "sago-grain" granulations—trachoma. At a later stage a development of connective tissue takes place both in the papillæ and in the granulations, until in course of time the whole conjunctiva gets converted into cicatricial tissue, which during the process of contraction implicates the deeper structures of the lids, thus producing deformity of the tarsal cartilage with inversion of the eyelashes. In all acute inflammations accompanied by discharge, the ocular conjunctiva is invariably implicated; while in trachoma, pannus affects the conjunctival covering of the cornea, and the termination of the most severe cases of granular ophthalmia is complete atrophy of the conjunctiva, so that the covering of the eyeball is dry, shrivelled, and cuticular, a condition described as xerosis conjunctivæ, or xerophthalmia.

2. If the bulbar conjunctiva be primarily affected, the inflammation is unaccompanied by discharge, but its products collect into little localised heaps, which usually form the termination of a leash of blood vessels. In this group are included all the eruptive varieties of conjunctivitis, generally spoken of as strumous ophthalmia.

3. If the retrotarsal fold be primarily affected, the lymphoid tissue, which is normally present in small quantity, rapidly increases under the stimulus of inflammation, and collects into round pinkish translucent bodies about the size of a pin head, projecting from the surface of the conjunctiva — follicular

conjunctivitis. The follicles are for the most part in the retrotarsal fold, and are arranged in rows parallel to the border of the lid. They may be numerous, but are rarely visible until the lower lid is everted. If, as sometimes happens, the inflammation extends to the palpebral conjunctiva, they will be accompanied by catarrhal discharge. In its most typical form, however, follicular conjunctivitis presents but little redness of the eye, and its chief symptoms are sensations of itching and heat, and difficulty in seeing to read or sew by artificial light. It occurs for the most part in children at school, and both eyes are usually affected. An acute attack may be excited by the long-continued use of either atropine or eserine, but the disease occurs far more frequently, and may even appear in epidemic form, as a result of over-crowding and bad ventilation. It always runs a prolonged course, is very liable to relapse, and, undoubtedly, predisposes to attacks of other forms of conjunctivitis. In the treatment of follicular conjunctivitis, mild antiseptics, such as lotions containing salicylic or boracic acid, are of great service in the early acute stages, while stimulants and astringents, such as sulphate of copper and tannic acid, are of value in hastening the absorption of the follicles in the later stages. When the lids are sealed by discharge in the morning after sleep, ointments containing aristol, iodoform, or iodol are indicated, and these drugs in the form of a crayon may be applied to the retrotarsal fold once or twice a day. When symptoms of asthenopia are pronounced, the refraction ought to be carefully examined, and if any ametropia be found, suitable glasses must be prescribed.

PYOSALPINX REMOVED BY LAPAROTOMY IN THE EARLY PUERPERIUM.

By R. Milne Murray, M.A., M.B., F.R.C.P.Ed., F.R.S.E.[1]

The recent literature of operative gynæcology contains a considerable number of cases in which the abdomen has been opened during pregnancy and the puerperium, for the removal of a suppurating tube, both before and after rupture. The results of this procedure have been in the main so gratifying, that we may regard it as an established method of dealing with this grave complication. Still the number of recorded cases is not so great as to warrant us in regarding such interference as a commonplace of practice. Further, almost every case has features of its own, either in its history, its clinical manifestations, or in the details of the operation, and this, along with the fact that the diagnosis of the precise condition of things to be dealt with is not always too clear, renders the account of any case falling under this category a matter of some interest.

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The diagnosis of a pyosalpinx in early pregnancy—say, up to the third month—is a matter of comparative simplicity. Careful bimanual examination will determine the presence of an enlarged tube in one or other fornix, or sometimes behind the uterus, and the recognition of such a condition, considering the risks involved as pregnancy advances, demands immediate operative interference. The fact that it may be sometimes difficult to distinguish this from an extra-uterine gestation only accentuates the wisdom of prompt measures. In the last three months of pregnancy the case is different. The diseased tube may have been fairly quiescent during the progress of the pregnancy, and subjective symptoms of local disturbance may be absent, or so obscure as to attract no special notice. Moreover, if pain is complained of, the size of the uterus interferes with accurate exploration of the pelvis bimanually; and besides this, the ovary and the tube are raised out of the true pelvis and withdrawn beyond the reach of the ordinary resources of diagnosis.

In such a case the first hint of trouble may come from the rupture of the tube, or the ejection or oozing of its contents through the abdominal opening, setting up a more or less definite peritonitis. But even then, with the diagnosis half established, the question of operative procedure is a complex one. The removal of the tube, and the necessary treatment of the peritoneum, is a very different matter when the abdomen is filled by a full-term uterus, from what it is when the uterus has only just emerged from the true pelvis. From considerations such as these, it seems to me the case which I wish to put on record has some interest.

The patient consulted me first in August 1895. She was then 31 years of age, had been married two years, and had never been pregnant. She complained of profuse periods and great debility, which she attributed to the menstrual losses. These had come on after severe mental and physical strain in connection with the illness of a near relative. I found the cervix hard and small, the uterus of normal size, but sensitive and drawn to the left side. The left fornix was flatter and fuller than usual, but no definite condition could be made out. I advised the use of hot douches, with iron and other tonics, and small doses of ergot at the periods. Three months afterwards she reported herself quite well.

Next year she became pregnant, and in the beginning of 1897 she was delivered normally of a daughter.

I again saw the patient in August 1898, when she complained of a recurrence of her former symptoms, and I recommended a similar course of treatment. I was unable to examine her at this time, as her period had come on during the journey into town. She promised to come back soon and report herself. I did not, however, hear from her for about three months, when she wrote informing me she was again pregnant. I heard nothing more of her until the 12th July of this year, when I received a telegram asking me to see her at once. When

I arrived I found that for some months she had been complaining of a pain in the left ovarian region, which occasionally had been very severe, compelling her to lie down for some hours at a time. On the morning of the 7th, that is five days before I saw her, she was awakened by an excruciating pain in the left side, so severe as to induce faintness. Poultices and laudanum relieved this, and next day she was able to sit up a little. The temperature was taken that night, and found to be 101°·5. On the 9th, the temperature was still 101°·5, and that evening labour pains set in. The os dilated to the size of a half-crown piece, after which the pains ceased entirely. On the 10th and 11th matters remained much the same. The temperature varied from 100° to 101°, and there was a constant dull ache in the left side, with occasional exacerbations. When I saw her on Wednesday the 12th, she was lying on her back with her knees drawn up. She had a curious anxious expression, and her complexion, usually rather florid, had assumed a peculiar yellow tinge. Her temperature was 101°·5, and her pulse 98, and rather compressible. Gentle pressure in the left ovarian region caused wincing, but she thought that, on the whole, the pain was less that day than it had been since the 7th. The vagina was moist, and the os admitted two fingers. The cervix was quite taken up, and the membranes bulged slightly. Pressure in the left fornix caused some pain, but nothing abnormal could be felt. The head was freely movable, and had not engaged in the brim.

On a careful review of the history and symptoms, I felt at a loss to account for the condition, except on the assumption of some tubal mischief being present. The condition of the left fornix in 1895 suggested an old-standing inflammation in the left broad ligament or its associated structures, and the continued discomfort complained of in that region, in the later months of pregnancy, suggested a recrudescence of this condition. Further, the sudden acute attack of the previous week, followed as it was by a continued rise of temperature, pointed to an escape of pus into the abdominal cavity.

With this idea in my mind, I considered the question of opening the abdomen there and then; but with the uterus undelivered, I thought it would be next to impossible to reach the deeper parts of the peritoneum, where I presumed the trouble was, and I felt that any attempts to empty the uterus hurriedly would be complicated by risks much greater than were justifiable. On the other hand, the state of the os and cervix showed that labour could not be long delayed, and I accordingly advised waiting until delivery occurred, keeping the temperature and other indications under close observation.

Labour set in at midnight on the following day—the 13th,—and at 2.45 A.M., the os being fully dilated, and the head low down, forceps were applied, and a male child was safely born.

On the morning of the 14th, the patient was sick and prostrate. Her temperature 96°·6 and the pulse 90. As the day wore on, she seemed to improve, and took some nourishment. About 8 P.M. the temperature was 101°, pulse 93. There was some thirst, and no pain was felt except on pressure in the left side. The lochia was normal, and urine had been passed. At 8 P.M. sulphonal was given, and she was asleep in half an hour. These facts were communicated to me in a letter which I received at 8 A.M., on Saturday morning the 15th. Half a hour later, I received a telegram asking me to see the patient at once, as she had become worse. I took with me the instruments required for an abdominal section, and reached the patient at mid-day. I found her looking exceedingly ill. The temperature was 103°·5, the pulse 130, thready and compressible. The tongue was thickly furred, and the expression profoundly anxious. She lay with both legs drawn up. There was marked tympanites, the uterus lay in the middle line, the fundus at the umbilicus. There was much tenderness all over the left side of the abdomen, but especially just over Poupart's ligament. The lochia had been rather profuse, some clots having come away, but it seemed quite sweet. She complained of thirst, and there had been much sickness and retching during the afternoon.

Per vaginam, the left fornix felt fuller than normal, and pressure caused great pain, especially when any attempt was made to displace the cervix to the right. The patient was obviously very ill, and the symptoms had come on so soon and so urgently after labour, that I felt if anything was to be done there was no time to be lost. Dr. Gordon of East Linton, who saw the case with me, was of the same opinion, and I had no hesitation in advising opening the abdomen. I telegraphed for Dr. Lackie, who, at great personal inconvenience, answered my summons, and arrived shortly after three o'clock. The room in which the patient lay was anything but an ideal one for an abdominal operation. It was small, and its one window looked, at a few feet, into a dead wall. Yet the patient was so feeble that I dared not risk moving her into another room, the nearest available one being at the other end of a long narrow passage. We accordingly arranged a table as best we could, and after she was under chloroform, which was most skilfully given by Dr. Gordon, we lifted her on to it.

On opening the abdomen, I passed my hand into the left side of the pouch of Douglas. The walls of the pouch were crossed everywhere by fine recent adhesions, which gave readily.

Without difficulty I brought out the left tube and ovary. The tube was intensely congested, of a dark crimson colour, and, though much dilated, was to all appearance empty. The ovary, about twice the normal size, was dotted over with recent adhesions of a bright red colour. There was no abnormal amount of fluid in the peritoneal cavity. The intestines were so much distended with gas that it was with the greatest difficulty we could keep them in the abdomen, and some coils which escaped gave us much trouble before they were returned. I ligatured the broad ligament as near the uterus as I could, and removed the tube and ovary.

With some trouble I brought up the right tube and ovary, which were well behind the uterus. The tube was normal; the ovary was also normal, except that it was dotted over with a few adhesions like the other. I returned both to the abdomen. The peritoneal cavity was then washed out with several quarts of 1 per cent. lysol solution. Nothing in the shape of purulent material came away with the washing.

The question of drainage was now considered. The only possible method seemed to be an opening through the vaginal roof, but I shrank from this when I thought of the vicinity of the lochial discharge and its unspeakable potentialities. But the demand for drainage of any kind did not seem very pressing. We had removed the supposed source of the mischief, and the peritoneum did not seem extensively, but rather locally, affected. Accordingly, leaving about a pint of lysol solution in the cavity, I closed the wound. The uterus had bled freely during the operation and the necessary handling of the organ, so I thought it advisable to wash out the cavity with lysol solution at 120° F. Some large clots came away, and the uterus contracted firmly. A copious enema was given, and the patient put to bed. At 5.30, when we left, the temperature was 101° and the pulse 100. She passed a good night, without sickness, and in the early morning took a few spoonfuls of chicken jelly with relish. At 9 A.M. next morning the temperature was 98°·8, and she was free from all pain. I saw her on Monday, and found her very comfortable, pulse 90 and temperature normal. From this time onward she made an uninterrupted recovery. The wound healed perfectly.

Six weeks after, the uterus was 3 in. by the sound, and nothing abnormal could be felt. The uterus lay in the middle line. Since the operation she has menstruated in a perfectly natural fashion, without pain.

On examining the amputated tube, I found that the canal was so much dilated that a thick pair of catch forceps could be passed along to within a quarter of an inch of the uterine end with great ease. The fimbriæ were short and granular on their inner aspect. On stripping the tube, a minute drop of yellow purulent material escaped at the uterine end. Unfortunately, the specimen was placed by mistake in strong corrosive solution, so that no culture could be made to determine whether a micro-organism was present.

Among several matters of interest in the history of this case, there is one feature to which I should like to direct a moment's notice. If one does not wholly misinterpret the attack of acute pain on the 7th, on that day an escape of purulent matter occurred from the diseased tube. Constitutional symptoms of a marked character appeared then and continued. But it is remarkable that until the 12th, that is five days later, no profound manifestation occurred. This, on the other hand, appeared with great suddenness twenty-four hours after labour. Are we to suppose that this sudden manifestation appeared as the result of what is termed the "strain of labour," a term in common use, not always, if ever, associated in one's mind with any very definite meaning? Or are we to seek for an explanation of the sudden change for the worse in the patient's condition, in the change from pregnancy to the puerperium. For five days the morbific influence, whatever it may have been, was at work in the peritoneal cavity, but so long as pregnancy lasted the mischief made little progress, so far at least as any outward sign went to show. But within twenty-four hours of the entry on the puerperium a change occurred so profound and overwhelming, that no one who saw the patient doubted for a moment that she was in imminent peril. It seems to me only reasonable to look for an explanation of this phenomenon in some subtle change in the vital processes, or tissue metabolism, which follows the passage from the state of pregnancy to the state of puerperium. A comparatively limited experience of practical obstetrics suffices to show us that a puerpera is in a state of most unstable equilibrium. Her proneness to deviate from the normal must be accounted for by something more concrete than the "strain of labour." It is obvious that the sudden withdrawal of the child and the change in the physiology and tissue chemistry of the mother which this means, must involve complicated processes of rearrangement, which may themselves become disturbed, or in their progress render her less capable of resistance to morbid influences. When an army is rearranging its units, and changing the order of its formation, its power of resistance is at a minimum, and it is then least able to withstand the onslaught of the enemy. The most anxious days to the obstetrician are those of the early puerperium, and the case recorded is an illustration of but one in a long catalogue of possibilities he must keep in mind. I take this opportunity of thanking Dr. Lackie, not only for his skilful assistance, but also for the moral support he gave, in a somewhat anxious experience.

A CONTRIBUTION TO THE TREATMENT OF HYPERTROPHIED PROSTATE BY VASECTOMY.

By T. Vincent Jackson, F.R.C.S.Ed., *Surgeon to the Wolverhampton and Staffordshire General Hospital; Consulting Surgeon, Orphan Asylum, Wolverhampton.*

The miserable existence which is the lot of those unfortunates who suffer from enlarged prostate, and the distressing evils which this condition brings as a consequence, are so generally admitted, that it cannot be wondered at that in this, the later portion of the Victorian era, efforts should have been made to give, through surgery, some relief, and even, if possible, more than relief, for an ailment which makes life intolerable and unbearable. For this purpose three operations have been recommended—Prostatectomy (intravesical), castration, vasectomy (vasotomy).

Prostatectomy.—At the meeting of the British Medical Association in Leeds, 1889,[1] the late Mr. A. F. M'Gill, by a series of cases reported and exhibited, clearly demonstrated that suprapubic prostatectomy was a practicable and an effectual method of treatment for hypertrophied prostate.

Later experience has somewhat dwarfed the initial opinion formed of the value of "M'Gill's operation," its dangers have been confronted; and further, after its performance the promise of amelioration of symptoms has not always been realised. The operation is by no means always simple, and profuse hæmorrhage has occasionally followed its performance.

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[1] *Brit. Med. Journ.*, London, 1889, vol. ii. p. 863.

Castration.—In the *Transactions of the American Surgical Association*, 1893–1895, Dr. J. William White of Philadelphia, to induce bulk-lessening (shrinking) of the prostate, advocated removal of the testes. Unfortunately it has turned out that this operation is liable to be followed by various unpleasant symptoms (mania-dementia), and even by death. How strange it is that all novel surgical operative proposals in time become penalised by their too general and indiscriminate employment. Selection is omitted. The operation is rushed, and it is only when adverse results come to pass that a pause is made and a weighing of the true value of the procedure is the result. In (April 1897) a lecture delivered by Dr. J. W. White,[1] he complains of the way his operation of castration for hypertrophied prostate has been abused, and with almost a sigh he states that he never encouraged the idea that his operation was a universal panacea. History repeats itself. Was not oöphorectomy abused? Is not the operative treatment of appendicitis running in that direction? and the same may be said of the too ready opening of the mastoid for otitis media. Dr. White also says:[2]—"If the patient is not very old, retains his sexual power, has sound kidneys, and only a moderate amount of residual urine, the operation is out of the question, and only catheterism is required. If the residual urine reaches 12 oz., and if it does not diminish under catheterism, the danger from backward pressure on the kidneys, increasing atony of the bladder and cystitis, are so great that vasectomy is indicated. In patients with larger prostates, with 8 or 10 oz. of fœtid or muco-purulent residual urine, with frequent micturition and pain on the introduction of the catheter, some operation—vasectomy, castration, or prostatectomy—is indicated. The younger the patient, the greater the sexual power, the sounder the kidneys, and the better the general health, the more the surgeon should incline towards prostatectomy. If the patient is somewhat older and the sexual power is becoming enfeebled, vasectomy is to be chosen. If of still greater age, with marked renal disease or great failure of health, the same operation (vasectomy) is indicated. If, however, with the greater age and distinctly lessened sexual power, the renal and general conditions *are good*, castration promises the most benefit with the least mortality. In the worst cases, in which the prostate is enormous, the cystitis excessive, the bladder dilated and atonied, the retention absolute, the kidneys inefficient, and catheterism difficult and occasionally impossible, any operation involves risk, but this must be taken. Castration in these cases is the best procedure; it will occasionally fail, but often the improvement is marvellous." This is a long extract, but the utterances of the ripe experience of a surgeon of the eminence of Dr. J. W. White are worth recording, and are worth reading, especially as the statistics of the operation now amount to several hundred cases.

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[1] *Univ. Med. Mag.*

[2] *Lancet*, London, 1897, vol. i. p. 1286.

Cabot of Boston (quoted by Reginald Harrison), in a paper published by the American Surgical Association, May 1896, mentions that castration is called for in cases of enlarged prostates, when the obstruction is due to the pressure which is exerted thereby upon the urethra and prostatic portion, and is useless in myomatous and fibrous enlarged prostate glands. Freemantle[1] has brought together all that could be collected from the published statements and records *re* the treatment of enlarged prostate by castration; and he compares the advantages and disadvantages of single and double castration and excision of the vas. He says that the (1) removal of the testes in cases of hypertrophied prostate causes a relief of symptoms and usually a reduction of the hypertrophy, analogous to the effect of oöphorectomy on uterine fibro-myomata. (2) Shrinking of the prostate is probably due to the removal of some subconscious reflex stimulus, normally conveyed to it from the testes by way of a lumbar-spinal centre. (3) This is the more especially suggested by the fact that removal of one testis will sometimes cause a corresponding one-sided shrinking of the prostate. (4) The immediate or rapid relief of symptoms in these cases is almost entirely due to relief of congestion and œdema in the lymph spaces and venous plexuses of the urethra and prostate. (5) Double castration is less dangerous than prostatectomy, and will cause an amelioration of the chief symptoms in about 80 per cent. of the cases. (6) The mortality is greatly increased by operating upon patients with advanced kidney disease, and operation in early stages will be performed with a better chance of complete cure and almost without risk to life. (7) If castration be refused, excision of the vasa deferentia, although of less certain efficacy, may be recommended.[2]

Sometimes after castration the improvement in micturition is exceedingly rapid, and even cases of unilateral castration have been recorded in which in old people (æt. 87) encouraging results have followed.[3]

Vasectomy.—Mr. Reginald Harrison writes a letter,[4] in which he declares that, some years before Dr. White published his remarks upon castration in preventing growth of the prostate, he had for this purpose subcutaneously divided, just below the external abdominal ring, the vas deferens. This was readily done, first on one side, then on the other, by a tenatome, at a few days' interval. The patient, a medical man beyond middle age, recovered, and six or seven years afterwards was alive and well. In a later communication,[1] Mr. Harrison speaks encouragingly of the operation, when practised under certain conditions emphasised, these conditions being the result of observations in a number of cases operated upon. (1) It has never been followed by any kind or degree of harm. (2) It has seldom failed to relieve the patient, though not always to the same extent. Vasectomy should be limited to the much more numerous class of cases in which the hypertrophy is due to a chronic state of blood engorgement, and not, of course, when it is due to a bulky middle lobe, to adenoma or carcinoma of the gland. It has been stated of vasectomy that it diminishes vesical irritability existing during catheter life or not, the necessity for using the catheter is lessened, and in consequence more sleep and rest are promoted. As the prostate atrophies, the passage of the catheter becomes easy and painless, natural micturition may be restored, but sometimes only partially, although here again, as it has been noted, the catheter is required less often. The operation of vasectomy is simple and easy, and local anæsthesia often suffices. The advice of those who have had a large experience is, that it is wiser to excise one vas first, and the second at the end of a month if it be required. If the right vas deferens is to be excised, the surgeon, standing on the right side of the reclining patient, with his right hand elevates the testis, then with the left forefinger and thumb he finds and localises the vas and brings it to the surface, a little below the external abdominal ring. The testis is now dropped, and with a scalpel in the right hand an incision of about 1 in. long through the skin is made, and repeated until, all the intervening tissues being divided, a hook is passed beneath the exposed vas, which being pulled out is ligatured top and bottom, and a good inch excised. The little wound is now sutured and the dressings applied.

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[1] *Guy's Hosp. Gaz.*, London, 1896.
[2] *Lancet*, London, 1897, vol. i. p. 1158.
[3] *Lancet*, London, 1899, vol. ii. p. 409.
[4] *Brit. Med. Journ.*, London, 1893, vol. ii. p. 708.

If vasectomy, as with castration, is abused, a disappointing result will doubtless have to be faced; but if it is reserved for that particular variety of prostatic hypertrophy previously mentioned, my practical experience teaches me that at least no harm will follow its performance, and almost certainly much benefit, comfort, and a release from those symptoms which it is better to read of than be a victim to. I have performed vasectomy three times, and each operation has been followed by the gratifying gain for which it was done. Retention soon ceases to require the catheter, yielding to personal efforts at micturition. In time, the amount of residual urine lessens, and frequently it becomes non est, so that the misery of existence is concluded.

Atrophy of the testes, or any change in the epididymis, has not been noted. Vasectomy is a procedure which can be performed without systemic anæsthetisation, or the removal of any organ, the patient retaining his anatomy and whatever virility these organs may be possessed of.

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[1] *Lancet*, London, 1899, vol. ii. p. 332.

Mr. Mayo Robson writes me as follows: "I do not care to advocate castration in prostatic hypertrophy, as I have known of several cases of serious mental disturbance afterwards, but as a minor operation where the patient is not in a fit condition to bear prostatectomy, the division of the vas deferens on both sides is worth considering."

CASE 1.—*Retention and dribbling of urine, hypertrophied prostate, left inguinal hernia, double vasectomy, radical cure of hernia; result successful.*—E. C., æt. 64, joiner, married, was admitted into the hospital, 8th February 1897. States he has had straining and frequency of micturition for several months past, both by day and by night, accompanied with constant dribbling. The straining is very severe. No blood passed.

On *9th February* the bladder was sounded, but no foreign body detected, neither was there a middle lobe or a collar around the vesical termination of the urethra. The prostate was large in all directions, reaching backwards beyond the point of the forefinger. The enlargement was uniform, and the elastic resistance equal at every point—now nodular—and it invaded the lower portion of the capacity of the rectum.

13th February.—The right vas deferens was exposed, and, after being ligatured in two places above and below, a good inch was excised; the cutaneous wound being sutured and dressed.

14th February.—No urine passed since the operation except that drawn off by catheter; as the dressings were slightly soiled, they were changed.

15th February.—No incontinence; catheter used as before.

20th February.—Removed sutures from wound, now firmly healed. Per rectum—prostate less full, and forefinger can now reach to bladder beyond it. The right half seems less in bulk than the left; catheter still required.

22nd February.—Passed with a good deal of difficulty, 2 oz. of urine.

24th February.—Passed 4 oz. with straining.

27th February.—Radical cure for left inguinal hernia performed; also excision of a portion of the left vas deferens.

2nd March.—Passes more urine than previously, and the straining is very much less; the catheter enters the bladder more easily since the last operation.

3rd March.—Passed 19 oz. of urine without catheter, during the last twelve hours; the ability to pass his urine daily increases.

On *29th March* it reached in twenty-four hours, 2 pints.

On *28th April,* discharged, perfectly well, passing his urine easily, varying in amount from 2 to 3 pints or more daily.

CASE 2.—*Self-inflicted wound of throat, very large prostate, retention and dribbling of urine; excision of vasa deferentia.*—John A., æt. 73, married, admitted 18th March 1897, having recently cut his throat.

History.—Thirty years ago, commenced to have difficulty in passing urine, and this continued and increased until a complete inability to do so supervened. He describes his existence as being "horrible"—pain was almost continuous, retention of urine was constant, and an involuntary dribbling was more or less present day and night. The action of the bowels was very difficult, and required a great effort. His health broke down, and he suffered great mental depression. Finally, in despair, he cut his throat, and for that he was brought to the hospital, and when admitted was in a very exhausted and enfeebled state. The patient was kept in bed, and regular catheterisation was employed. A day or two after admission, the bladder was examined for stone, but negatively. Rectal examination with the right forefinger revealed that the anterior wall of the gut was much pressed down, and indeed impeded the passing of the finger upward, due to a very great symmetrical enlargement of the entire prostate, and by no effort could the finger point arrive at the base. It was the largest prostate I have examined. The surface was firm and elastic, but slightly uneven in places; no tumour or isolated bulging was discovered. No measurement was made of the length of the urethra.

22nd March.—Double vasectomy was performed.

23rd March.—Passed urine without catheter for the first time. The scrotal wound on the right side healed straight off, but that on the left side, the direction in which the penis lay, became fouled—the dressings being unavoidably wetted with urine on account of the dribbling; slight suppuration occurred, but at the end of a week healing was concluded. The treatment employed consisted in using the catheter night and morning, and washing out the bladder once daily.

24th April.—Catheter discontinued, patient passing the whole of his urine himself. An examination of the rectum showed that its capacity was now normal; the prostate had much lessened in bulk all over; the point of the finger easily passing beyond the base line to the lower wall.

5th May.—Catheter has not been required since it was omitted.

24th May.—Patient discharged, free from all urinary discomfort, and happy in his mind.

CASE 3.—*Enlarged prostate, retention of urine, unilateral vasectomy; cured.*—F. B., æt. 58, married, admitted 10th August 1899; occupation, bootmaker. Suffered from complete retention of urine for two or three days before admission, but there had been difficult urination for some time previously. Habits temperate. A soft catheter being passed, relieved the retention, and it was regularly continued. The prostrate was found to be uniformly much enlarged, base line being beyond the reach of forefinger.

19th August.—Right vasectomy performed, 1½ in. of the vas being removed.

2nd September.—Wound perfectly sound; passes his urine freely; catheter used night and morning, he having been taught how to do so.

6th September.—Prostate still uniformly enlarged, but reduced to one-third of its original size, the point of the forefinger reaching the base of gland.

8th September.—Discharged; passes his urine easily and at will; instructed to pass the soft catheter every night before going to bed.

This man has lately been seen, and he states he is perfectly well and comfortable, all his troublesome urinary symptoms having left him.

NOTES ON A CASE OF SUDDEN DEATH FOLLOWING LABOUR - DUE TO CARDIAC DISEASE AND PNEUMONIA.[1]

By G. W. Simla Paterson, *Physician, Cowgate Dispensary, Edinburgh.*

As cases of sudden death during pregnancy or the puerperium are comparatively rarely met with, I venture to bring the following case under notice:—

Case 1.—On Sunday, 5th November last, at midnight, I was asked to see Mrs. M., æt. 32, secondipara, who expected to be delivered about the middle of November. I found her in a condition of extreme breathlessness, amounting to orthopnœa, accompanied by very frequent spasms of coughing and expectoration of considerable quantities of red blood, mixed with mucus. She complained of a sensation of pain and oppression in the region of the heart, and volunteered the statement that she was suffering from asthma, having had two similar, though not so severe, attacks during the course of her pregnancy.

On examination of the chest, there was found to be comparative dulness at both bases posteriorly, but the breath sounds were completely hidden by the abundant coarse crepitations which were present all over the chest. The heart's action was so rapid and tumultuous that no murmurs could be heard.

She was much cyanosed, the respirations being between 50 and 60. The temperature was 101°, and the pulse 144, feeble but regular, except during the spasms of coughing. There was no œdema of the lower extremities. Labour had not commenced.

About 8 o'clock the following morning I was sent for, and on arriving found the child and afterbirth born. They were lying on the floor, while the patient was sitting on the edge of the bed, being too breathless to lie down. The uterus was firmly contracted, and there was no hæmorrhage. I put her to bed and performed her toilet as speedily as possible, and stimulated her freely with whisky and strophanthus. Dr. Haultain saw her with me early in the forenoon, and concluded the case was one of pulmonary thrombosis, and gave a very hopeless prognosis.

In the afternoon, as her condition was getting worse, the cyanosis increasing and the pulse getting weaker, I performed venesection, drawing off about 12 oz. of blood, and injected $\frac{1}{60}$ gr. of sulphate of strychnia subcutaneously. This relieved her symptoms for the time, but she rapidly sank, dying at 8 P.M., exactly twenty-four hours from the onset of her symptoms.

Previous History.—This was a very difficult matter to ascertain, as the patient was formerly quite unknown to me, was amongst complete strangers, and was too ill to give any satisfactory information herself. She had borne a child four years previously, who is still alive. She denied ever having had rheumatic fever, but stated that she had suffered from chorea when a child, and that during the present pregnancy she had on several occasions felt choreic movements. The most important fact elicited was this, that twice during her pregnancy, namely, between the second and third month, and at the seventh month, she had attacks of breathlessness with hæmoptysis, exactly similar to the present one, but of less severity, from both of which she had entirely recovered. On the day on which she took ill she had her dinner as usual, and at four o'clock went out to call for a friend, returning at seven o'clock complaining of breathlessness, which she attributed to the wind, which was high at the time. Dr. Harvey Littlejohn kindly performed a post-mortem examination next day, which revealed the following conditions:—

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[1] Read before the Obstetrical Society, Edinburgh.

The uterus showed the normal appearances after labour. The pelvic veins contained ordinary post-mortem clot. The heart was the seat of old-standing endocarditis. The aortic valves were much thickened, and covered with vegetations, giving rise to aortic stenosis. The mitral valves also were thickened, the orifice admitting the little finger with difficulty. Both aortic and mitral stenosis were therefore present. Both ventricles were hypertrophied, and both auricles dilated. The pulmonary valves and arteries were healthy.

The left lung was slightly adherent to the thoracic wall. On section, the upper lobe was congested and œdematous, while the lower lobe was markedly consolidated. The right lung was also adherent; its upper lobe was œdematous and congested, the middle lobe was in the condition of splenisation, and sank in water, while the lower lobe also was congested.

Microscopic examination revealed brown induration, chronic congestion, and a recent fibrinous pneumonia in addition, rendering the lung quite solid.

The left kidney was completely cystic, and on section was found to contain a large quantity of tubercular pus. The right kidney had its capsule adherent, contained one small cyst, and was the seat of chronic nephritis, the cortex being narrowed and the tubules diminished. The microscope showed chronic cirrhotic changes, to which were added an apparent recent congestion with marked epithelial changes of a granular nature in the tubules of the cortex.

The liver was slightly fatty and friable, and the spleen was somewhat adherent, but otherwise healthy. No microscopic examination of these organs was made.

The stomach and intestines were greatly distended with gas, and the former contained a quantity of tarry looking fluid, probably altered blood which the patient had swallowed, mixed with Bovril, etc., but its mucous membrane showed no congestion. There was no ascites.

The clinical features and post-mortem appearances described are, at first sight at least, difficult to reconcile with each other. The evidence of chronic cardiac and pulmonary mischief of an exaggerated type, as revealed post-mortem, seem to have given rise to little discomfort to the patient during her pregnancy, and were not associated with the clinical features which one would have expected to be present, and at the same time no characteristic symptoms of the onset of pneumonia which had evidently been present for some time were complained of.

It is well known that pregnancy tends to exaggerate pre-existing cardiac lesions; and although, if they be of minor severity, pregnancy and labour may be completed without any untoward symptom, yet in lesions of a grosser type, especially if the mitral valve be affected, symptoms of interference with the circulation usually manifest themselves at an early period in the gestation, and may lead to premature expulsion of the uterine contents. In other cases during pregnancy symptoms may be absent, but during and after labour acute pulmonary congestion frequently causes the death of the patient.

In the case in point, however, sudden grave pulmonary symptoms were developed late in the pregnancy, and evidently were the primary cause of labour pains being started, and, as was natural to expect, the rapid demise of the patient after labour had been completed.

That mitral disease of so very advanced a type should have been present without giving rise to symptoms of backward pressure, such as œdema of the extremities, ascites, etc., is at once interesting and instructive, and would appear to be accounted for by the marked compensatory hypertrophy of the right ventricle, by which means the pulmonary circulation was maintained, notwithstanding the fact that the lungs showed evidence of venous congestion, which must have been present for some considerable time.

The sudden onset of symptoms would appear, from the condition of the lungs found post-mortem, to have been due to a superadded pneumonia, which, acting in association with the already highly congested state of these organs, was sufficient at once to entirely upset the pulmonary circulation and cause the death of the patient. As was to be expected, the somewhat premature onset of labour resulted and greatly increased the gravity of the condition, it being well known that in pneumonia expulsion of the uterine contents precipitates a fatal issue. Indeed, the wonder is that with such a variety of complications the patient survived as long as she did.

Although wrong in the actual diagnosis of the case, much may be said in support of the decision arrived at, namely, pulmonary thrombosis or embolism. The intensely sudden onset of symptoms, the hæmoptysis, air hunger, cyanosis, and tumultuous cardiac action, combined with absolute want of impairment of intellect, and a keen sense of her critical condition, which were maintained up to the last, form practically the typical features of this lesion. On the other hand, a retrospective study of the history of the case, and the previous similar attacks, should perhaps have led one to consider a cardiac source of the symptoms. Physical signs, however, were impossible to acquire, owing to the pulmonary accompaniments which obscured the cardiac sounds.

The possibility of pneumonia being present certainly suggested itself at first, but the intensely sudden onset of symptoms unattended by the premonitory indications of that disease, led me to look for some other explanation of the condition, even although there was dulness on percussion of the chest at both bases posteriorly. Certainly, on reflection, one cannot help thinking that pneumonia, under ordinary conditions, would offer the most reasonable explanation of the urgent symptoms, as a cardiac origin would not be expected at so late a period of pregnancy, while pulmonary thrombosis before the onset of labour is naturally unlikely. Not only, however, were the ordinary symptoms of pneumonia marked by the absence of premonitory indications and the comparatively low temperature of 101°, but also by the exceedingly free hæmoptysis. The diagnosis, therefore, of the case must be considered to be one of great difficulty, the conditions present suggesting the presence of any one of these lesions without their being exclusively characteristic.

Altogether, exclusive of the cardiac and pulmonary conditions, the diseased state of the kidneys seems to me to be of more than passing interest. That such gross lesions of these organs should exist at the end of pregnancy without having given rise to symptoms indicative of renal insufficiency, must be looked upon as of importance in relation to the supposed kidney origin of eclampsia. It was evident that her renal function was entirely performed by one kidney and that an unhealthy one, which showed, in addition to cirrhosis, subacute inflammatory changes of the epithelium, so often met with in eclamptic cases. In other words, a single diseased kidney was sufficiently able to cope with the extra strain thrown upon it during pregnancy, a fact which strongly points to eclampsia being the result of impaired functional activity in some other organ.

Many cases of pregnancy, complicated with heart disease, have been recorded, but in the majority of these the subjects have been known to suffer from cardiac disease long before full term has been reached, and have attained that period owing to careful treatment of their cardiac condition, while in others, symptoms have arisen during or immediately after labour; but in this case, however, the patient's first complaint was made within twenty-four hours of the fatal termination, the severe heart symptoms developing towards the end of gestation, but apparently independent of labour. They were in all probability caused by the sudden development of pneumonia, and combined with that condition were the cause of labour pains setting in, and were not, as is usually the case, the result of the severe extra strain thrown upon the heart by the sudden venous engorgement during and after the third stage of labour.

ON THE PHYSIOLOGICAL AND THERAPEUTIC EFFECTS OF THE RÖNTGEN RAYS: THE TREATMENT OF LUPUS.

By J. HALL-EDWARDS, L.R.C.P., *Surgical Radiographer to the General Hospital, Birmingham.*

(PLATES I. AND II.)

EARLY in the history of the application of the Röntgen rays to practical surgery, it was discovered that, under certain conditions, the skin and deep tissues exposed to their influence were destroyed or seriously injured. Most of the reports of these cases came from the Continent and America, and they were so unsatisfactorily described that at first little credence was placed in them by experimenters in this country, who, when dealing with cases in the ordinary way for producing radiographs, had noticed no ill effects.

During the eighteen months which immediately followed the publication of Professor Röntgen's discovery, I was daily engaged in producing radiographs for the purpose of diagnosis, yet no effect (good or bad) of a positive or convincing character came under my notice. Several patients complained of curious effects, which, however, were of so contradictory and unsatisfactory a nature, that I am compelled to attribute them to imagination and excitement.

In several cases of rheumatic arthritis, I was told that great relief from pain was experienced for several days after the application of the X-rays; and one patient was so convinced of the great benefit he received, that he visited me on several occasions in order that his foot might be exposed to the radiations.

That imagination played an important part in these cases I am firmly convinced; at the same time, it must be borne in mind that frequently great relief from pain is experienced by patients who are subjected to the action of electrical currents of extremely high tension.

The first authoritative statement of the "Hurtful Action of the Röntgen Rays" which came under my notice was a series of articles by Nikola Tesla,[1] a man of such profound learning in electrical matters, and such a painstaking investigator, that one was compelled to accept his statements. It must, of course, be remembered that Tesla was using for his experiments a high frequency coil of his own invention, which was capable of giving a current of far higher voltage than any which up to that time had been used in this country. He was able with this, and a specially devised tube, to plainly see the bones of the hand upon his fluorescent screen, at a distance of from 40 to 60 ft. from the source of the radiations.

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[1] *Am. Elect. Rev.*, May 1, 1897.

Even with this powerful apparatus, Tesla says: "To the action of these bulbs myself and several of my assistants were exposed for hours at a time, and although the exposures took place every day, not the faintest hurtful action was noticed as long as certain precautions were taken." He goes on to say that rather a contrary effect took place, for his own health as well as that of his assistants was improved, and that he entirely lost a troublesome cough. This latter effect may possibly have been due to the large amount of ozone which is ever present during the passage of high tension electrical currents through air.

Tesla had previously noticed that strong streamers, which, mostly at small distance, are formed on the body of a person, through the electrostatic influence of a terminal of alternating high potential, caused severe irritation of the skin. This fact is of great importance, as it has some bearing upon what I shall have to say later on. To get rid of these electrostatic effects, Tesla advises that a screen of thin aluminium should be used between the tube and the exposed part.

On using a tube having a platinum anti-cathode, without the aluminium screen, and at a short distance, hurtful effects were soon noticed. After a few minutes' exposure, a tingling and sensation of warmth was experienced. Later, deep-seated pain was felt, and ultimately the hand became swollen and red; acute inflammation set in; the hair was destroyed, and the growth of the nails impaired.

Tesla attributed these effects to the presence of the platinum, in accordance with his theory as to the manner in which the effects of the Röntgen rays are produced. Beyond a certain distance from the Crookes' tube, Tesla failed to notice any effect, no matter how long the exposure was continued. Tesla compares the effects on the skin with those received from contact with red-hot iron, and says: "In severe cases the skin gets deeply coloured and blackened in places, and ugly, ill-foreboding blisters form." In one case he mentions, a fearful sore was caused upon the abdomen of an assistant, from an exposure of five minutes, at a distance of 11 in., from a very highly charged platinum tube.

Without entering into a discussion on the theories set forth by Tesla, and of the precautions taken to mitigate against the production of ill effects, I must again draw attention to the fact that his apparatus was much more powerful than was up to that time generally used; and that, even with this, no ill effects were produced when the exposed part was placed beyond a certain distance from the tube.

My own apparatus consisted of an induction coil, with mercury (or platinum) interrupter, which gave a spark of from 12 to 16 in. in length. The current was supplied from an accumulator giving about 8 ampères at 12 volts, and during my numerous experiments I have tried nearly every form of tube yet made. The majority of tubes used have had platinum anticathodes, and they have been placed at such a distance from the part as previous experience had taught me to be the best. This has varied from 8 to 18 in. from the plate, whilst the time of exposure has varied from a few seconds to an hour. During the time I have been engaged at this special work, over 2000 cases have been exposed to the X-rays, yet the effects produced (with the exception of those produced purposely) have been so trivial that they would hardly be worth consideration, were it not for the fact that in publishing the results of a research not the slightest effect should be missed.

The following case is worthy of mention, although I would like it to be understood that I am by no means convinced that the effects described were due to the action of the X-rays; as, however, they were attributed to this cause, I mention it, in the hope that a like result may have been observed elsewhere:—

A child of 3 years of age was exposed to the X-rays for twelve minutes, at a distance of 11 in. from the tube, a 12-in. spark being used, for the purpose of locating a coin in the œsophagus. On the following day several small ecchymotic patches appeared on the neck; these died away in a few days' time, no further ill effects being noted. A short history of the case was published in the *British Medical Journal* of 4th June 1898. The child, who was under the care of Mr. George Heaton at the Children's Hospital, Birmingham, was weakly and ill nourished, and had had the coin in the œsophagus for a period of five weeks. The radiograph was taken whilst the child was under chloroform.

During the using of the fluorescent screen I have noted two cases in which ill effects have occurred. In such work it must be remembered that the parts are frequently brought much nearer to the tube than is the case in taking radiographs, and therefore the liability of producing ill effects is increased.

The first ill effects occurred upon myself, after giving a series of lengthy demonstrations on five successive evenings. At the time I suffered no inconvenience, but a week after the demonstration had ceased the skin near the roots of the nails became inflamed and sore, and afterwards dried and cracked. This was especially noticeable upon the right hand, which had been most exposed to the rays. I had previously noticed a slight soreness in the parts, but had attributed it to the effect of the photographic developer I was constantly using. This theory was, however, in this case upset, as during the week in question only one plate was developed. In a few weeks the soreness disappeared, but a line was left across each of the nails, those on the right hand being most clearly marked.

The lines were similar to those frequently seen after recovery from a severe illness (such as typhoid), and clearly pointed to some considerable interference in the process of nutrition.

After the lapse of a few months the lines disappeared, but ever since the nails have remained brittle, whilst I frequently experience a little soreness round them, and the quicks are always dry and cracked.

A short time since I examined the hands of a gentleman in London, whose business (that of a coil manufacturer) necessitates a continued and daily exposure to the X-rays. The skin of both hands was red and dry, whilst all his nails were new and brittle, the total destruction of the old ones having taken place some months previously. So susceptible is he to the ill effects of the X-rays, that he was obliged to considerably curtail his work, in order to allow of his nails being renewed. He also suffers from repeated attacks of conjunctivitis, which have lately been rendered less severe by his wearing glasses whilst experimenting.

This case is interesting, as it tends to disprove one of the theories put forward to account for the phenomena, namely, that the ill effects are in great measure due to the constant soaking of the hands in photographic developers, as the gentleman in question rarely or never develops a plate.

That there is a varying susceptibility to the influence of the rays is certain, the following case being a good illustration:—

A surgeon who was exposed to the influence of the rays for a period of about half an hour, during an operation for the removal of a foreign body from the hand, with the aid of the fluorescent screen, suffered during the next few days from an acute attack of conjunctivitis, which he positively asserts was due to the action of the X-rays. I myself have never suffered in this manner; and although during the operation in question I was more exposed to the rays than the surgeon himself, I experienced no ill effects whatever.

In the cases I have so far drawn attention to, the ill effects were of a slight character, and in at least two instances may have been due to other causes. In the remaining cases, idiosyncrasy and abnormally prolonged exposure were the predominant features.

Apart from a special susceptibility of the patient, no ill effects are produced, either when taking radiographs or when making examination with the fluorescent screen, granting that ordinary preventive precautions are taken, namely, that the tube is not brought too near the part, and that the exposures are not too lengthy.

Improvements in apparatus generally, and in X-ray tubes in particular, have so reduced the necessary time of exposure, that no ill effects should be brought about from this cause; whilst recently the introduction of the electrolytic interrupter enables one to work at such a distance from the part, and with such short exposures, that we should hear no more of the accidental production of X-ray lesions; at the same time it must be remembered that alarming and serious consequences may follow a lengthy exposure at short distance, and that large areas of tissue can easily be destroyed at will.

In the cases it is now my intention to record, the patients have been purposely exposed, for a lengthy time and at a short distance, from a highly charged Crookes' tube, with the intention of bringing about a desired result. Their history tends to prove that, when we know more of the causes and effects, we shall have at our command a therapeutic agent of considerable value.

The publication of the various effects accidentally produced whilst working with the X-rays, went to prove that the skin and superficial tissues could easily be destroyed without any injury to the deeper parts. This fact was sufficient in itself to suggest the intentional production of X-ray burns in the treatment of chronic skin diseases, such as lupus, where nothing short of the complete destruction of the diseased area has any effect towards cure.

In the following cases, exposure to the X-rays has been resorted to, for the purpose of ascertaining their therapeutic value in the treatment of lupus:—

Case 1.—*Lupus vulgaris.*—W. J., a boy, æt. 14, and an in-patient at the Birmingham Hospital for skin and urinary diseases, was handed over to me for treatment by my friend, Mr. Gilbert Smith.

History.—Lupus of the face first made its appearance when the patient was 3 years of age, and for a period extending over eleven years he has been under constant treatment.

Present condition.—The lower part of the face is entirely covered by the disease, and there is a large patch in the centre of the forehead.

The nose is in great part destroyed by the disease, aided by continual scraping. There are several small patches on various parts of the body, particularly upon the legs and feet.

For my experiment I chose a patch about the size of a five-shilling piece, situated upon the instep of the left foot. At the time the patch was in a quiescent state, and showed no signs of active inflammation. The upper third of the patch was covered with a dry scab, the lower part being of a pale rose colour, and covered with loose scales. Up to the time of my attacking this part, no treatment other than the application of a simple ointment had been adopted. At the roots of the toes there were three small patches, which were inflamed and discharging.

On 7th May 1898 the patch was exposed for fifteen minutes, at a distance of 2 in., from a highly charged Crookes' tube (with platinum anticathode), a 12-in. spark and mercury interrupter being used. The unaffected portion of the foot was protected from the action of the radiations by a piece of sheet-lead, about $\frac{1}{8}$ in. in thickness, through the centre of which a hole was cut, slightly smaller than the lupoid patch. During the exposure the only effect experienced by the patient was a slight sensation of warmth, which was, of course, due to the heating of the tube.

On 10th May the patient had experienced no ill effects from the exposure. The patch, however, appeared slightly more red. It was again exposed under the same conditions for a period of twenty minutes, the tube being placed only an inch from the skin. The protecting lead was again used. On 12th May the appearance of the patch was unaltered. A fifteen-minutes exposure was given at a distance of 1 in. from the tube. The hole in the protecting lead was considerably enlarged.

On 14th May the patch appeared slightly more red, but was otherwise unaltered. A fifteen-minutes exposure was given, at a distance of an inch from the tube, the protecting lead being dispensed with.

On 23rd May the whole of the skin on the front of the foot was inflamed and tender, the upper part of the patch being broken down, leaving a raw surface measuring 1½ in. by ½ in. Ten-minutes exposure was given, at a distance of 1 in. from the tube, no protecting medium being used. The wound was dressed with a simple lead lotion.

On 26th May the entire patch was broken down, together with the skin extending for at least half an inch all round it, leaving a larger ulcerating surface, of irregular shape, with ragged edges, nearly as large as the palm of the hand. The whole of the skin in the front of the foot was highly inflamed, and the small sores at the roots of the toes were open ulcers.

On 28th May the ulcerated surface was covered with healthy granulation tissue, and new skin was invading its edges. The surrounding skin was much less red and tender, and the small ulcers at the roots of the toes were rapidly healing.

On 17th June a raw healthy granulating surface, 3 in. in length and 1½ to 2 in. in width, occupied the anterior surface of the foot. The edges of the wound were being rapidly encroached upon by new skin.

The surrounding skin has now assumed its normal aspect, and the small patches at the roots of the toes have quite healed.

The boy was in excellent health, and felt no ill effects from the treatment. With prolonged and careful treatment of more than twelve months' duration the ulcer on the foot entirely healed, leaving a red scar, very unlike in appearance the scar which results from the accepted methods of treatment. I am informed that this scar has shown no tendency to again break down, although the case has not otherwise improved.

Case 2.—*Lupus erythematosus.*—*History.*—E. P., a girl, æt. 15, presented herself at the General Hospital, Birmingham, on 16th July 1898.

The case was kindly handed over to me by Mr. Gilert Barling. She first noticed a small sore upon her face in the previous December, which she attributed to having been burned with some hot brass-dust. This gradually spread over the face.

Present condition.—The face, with the exception of the chin and temples, is covered with the disease, forming a well-marked "butterfly." The scalp is not invaded.

There is a patch about 2 in. in diameter upon the anterior surface of the right arm. This first made its appearance some four months back, and is slowly spreading. This patch was chosen for treatment, and at the time of the first exposure it presented a dull red surface, 2 in. in diameter, covered with dirty-looking crusts and dried epithelium. The edges were of a purple-red colour. There was no sign of scar.

In this case a new method was adopted for protecting the healthy skin round the diseased patch. A solution of gelatine in water was prepared, and into this whilst warm was stirred finely powdered iodoform, until, upon cooling, the solution would just set. This preparation was melted and applied freely (with a brush) upon the skin all round the patch, every part which was likely to be reached by the radiations being well covered. The patch was now exposed to a highly charged Crookes' tube for a period of fifteen minutes, at a distance of 1 in. from the surface of the glass.

After the exposure the arm was wrapped in cotton-wool and a bandage applied, the protecting iodoform being left undisturbed. On the following day the patch was slightly more red; it was again exposed under the Crookes' tube as before. The next day the iodoform protecting medium was peeled off, cotton-wool and a bandage applied, and the patient was allowed to leave hospital.

For several days no alteration in the appearance of the patch could be perceived.

On 25th July (nine days after the first exposure) there was slight inflammation, and the patient complained of pain and soreness when the arm was moved or touched.

During the next two days the inflammation subsided and the pain disappeared, but on the morning of the 28th the greater portion of the patch had sloughed away, leaving a raw superficial surface, which appeared to be entirely limited to the diseased skin. The surrounding skin was red, but showed no signs of breaking down. Dressed with ung. boracic on lint.

On 2nd August the raw surface had slightly increased in size, and several small spots were seen upon the surrounding skin. These were undoubtedly due to the fact that in some places the iodoform protecting emulsion was not sufficiently thick.

The face is rapidly getting better. A week later the surface was covered with healthy granulations, and new skin is growing from the edges. The face was now nearly well.

On 18th August the wound was rapidly healing, and all signs of disease have disappeared from the face. Dressed with lotio rubia.

At this stage the mistake was made of allowing the patient to apply her own dressing, with the effect that when she presented herself at the hospital a week later the wound had assumed an unhealthy and diphtheritic condition, which took two months to get rid of.

About the middle of December the wound was completely healed, and the patient well.

CASE 3.—*Lupus vulgaris.*—This case was kindly handed over to me by Mr. George Heaton. *History.*—L. F., a girl, æt. 16. Lupus first made its appearance upon the anterior surface of the right thigh seven years ago. For two and a half years she has been under treatment at the General Hospital, Birmingham. On several occasions, after a lengthy stay in bed and careful treatment, all signs of active inflammation have disappeared for a time, only to return again after a few days' walking about. When first brought under my notice she had just had a rest, and only a small portion of the diseased surface was raw.

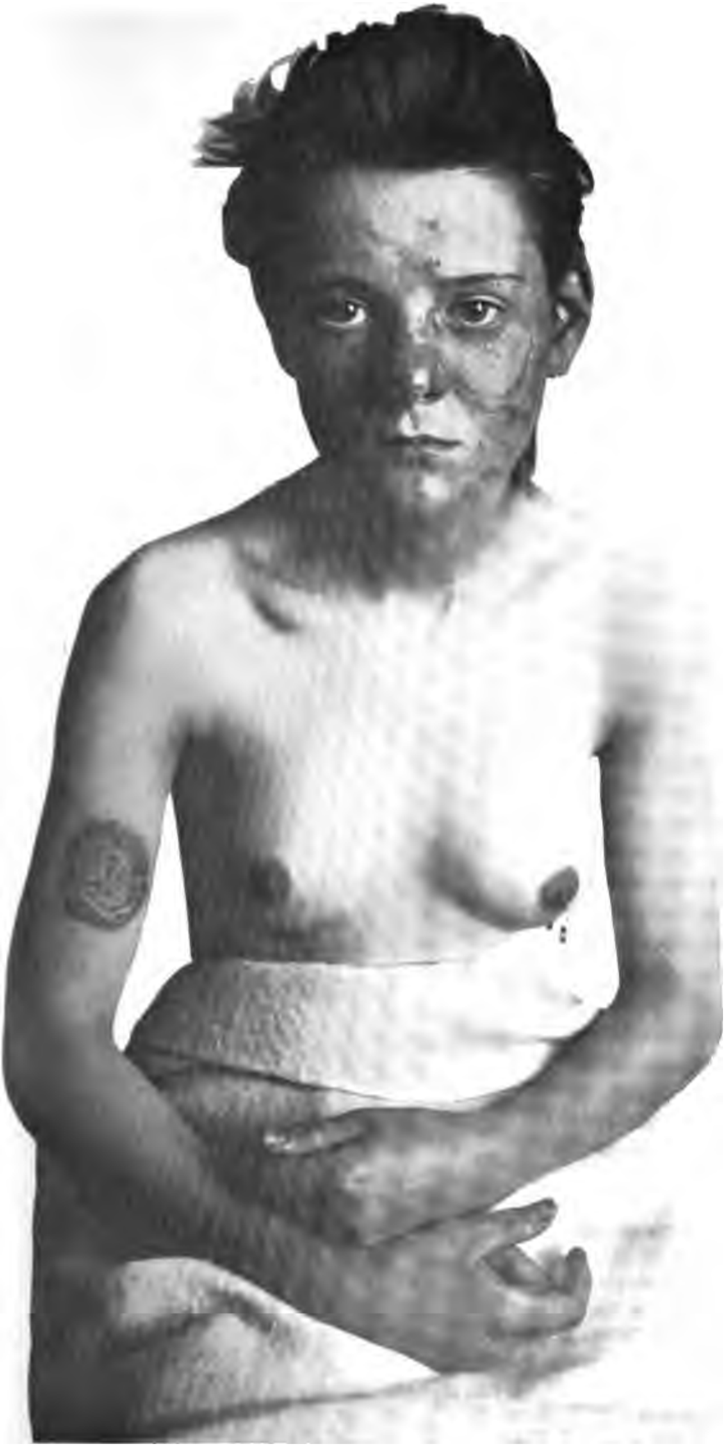
Present condition.—The lupoid patch covers only the front of the limb, and extends from 4 in. below the knee to the junction of upper and middle thirds of the thigh; the back of the limb is unaffected. The whole surface is red, or reddish brown, in colour, the edges of the patch being well marked and darker. Thin epidermic scales cover some of the surface above the knee, and there is also a patch of scar tissue. Immediately over the knee the surface is inflamed and discharging. The patient is a typical tubercular subject, and there is a distinct history of phthisis.

Twelve months since, a patch over the knee, about 2 in. in diameter, was exposed on two occasions, at a distance of 1 in., from a highly charged Crookes' tube, for a period of fifteen minutes, the remainder of the patch and the surrounding skin being protected by means of the iodoform emulsion used in the previous case. No result was noticed until eighteen days after the exposure, when the patch sloughed away, leaving an open ulcer. There has been considerable difficulty in getting this ulcer to heal, in great part due to the unsatisfactory state of health of the patient, aided by the fact that she has continued to use the limb during the whole period of treatment. At the present time there is still an unhealed healthy ulcer, about the size of a shilling, immediately over the patella. The healed portion of the patch is red and very unlike in appearance the usual scar tissue. The lupus has entirely disappeared, and nothing but healthy scar tissue remains to show its existence. I have recently applied a splint, in the hope of getting the remaining ulcer well. I have every reason to think that the case is cured, and this in the face of the fact that the patient is a tubercular subject.

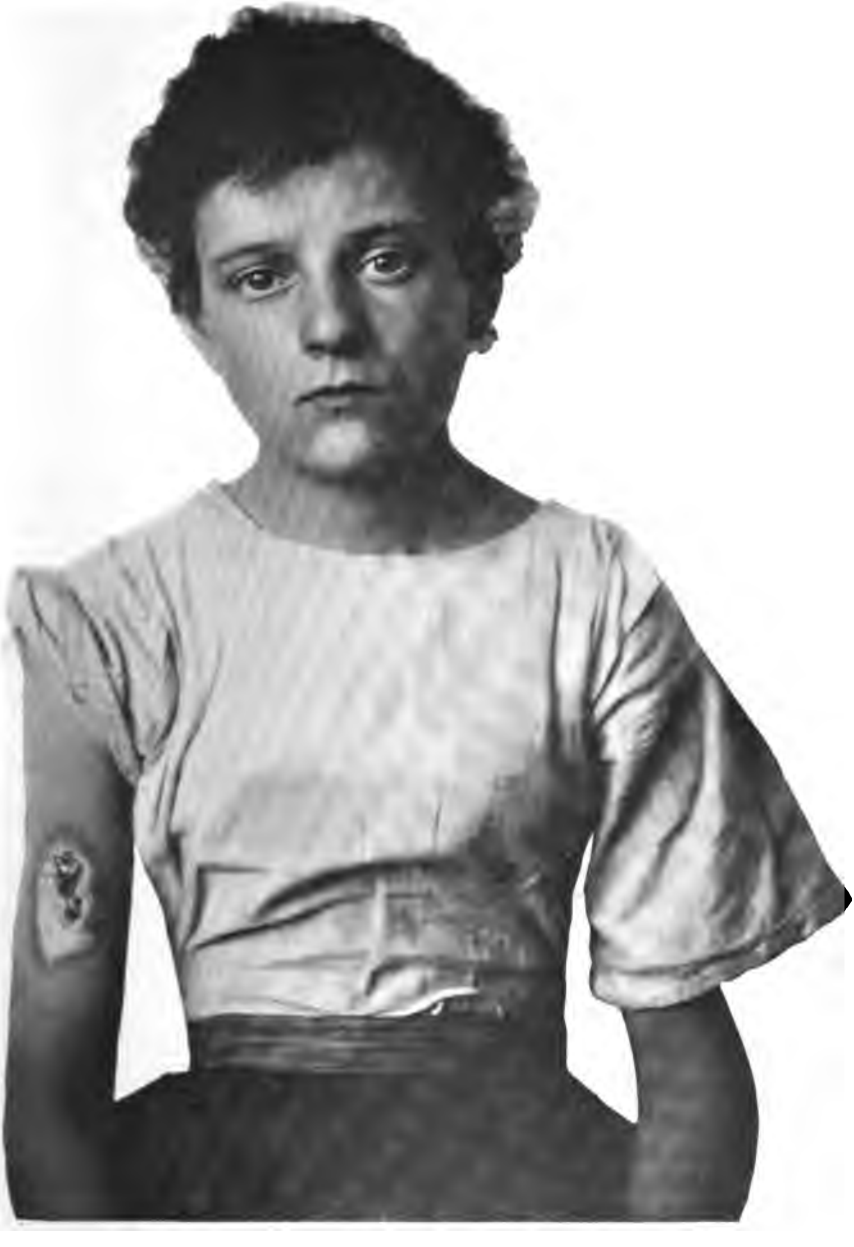
Note.—Since the above was written, treatment has been continued, and at the present time (1st January 1900) the wound is completely healed. Time alone will tell whether or no a complete cure has been achieved. Up to the present, however, the scar shows no tendency to break down, whilst the patient's general health has much improved.

In treating these cases, a special tube, 18 in. in length (so as to avoid sparking over), was used.

In summing up, it must be borne in mind that in Case 1 the treatment was purely experimental, and was undertaken in complete ignorance of the results which were likely to follow. Far too many exposures were resorted to, and I now feel certain that better results would have been brought about had one or, at the most, two exposures been given. Having gained the knowledge that a period of from fourteen to twenty-one days elapses between exposure to the Crookes' tube and the first appearance of symptoms, I dealt with the other cases more cautiously, with better results; and I am now of opinion that the same results



Lupus Erythematosus of arm and face before treatment with X Rays



Same case after treatment, showing scar on arm.

might follow a series of exposures made at such a distance from the tube that no inflammation would be brought about.

That the results are to an extent satisfactory, is encouraging; and a more complete knowledge of the length of exposure necessary, and of the best after-treatment to adopt, may lead to a completely successful issue. The curious fact about the treatment is the period of inactivity which follows exposure. What is taking place during the period between exposure and the first appearance of symptoms? To even guess at this we must have some idea of the manner in which the symptoms are produced. Tesla has shown that the placing of a sheet of aluminium between the tube in action and the skin has the effect of stopping all danger of producing burns. Now, as aluminium is exceedingly transparent to the X-rays, and allows them to pass through with great freedom, it is safe to conclude that the X-rays themselves play a very little, or no part in the proceedings.

I am inclined to think that the effects produced are entirely electrical in their origin, and are due to the electrostatic action or electrolytic discharges produced in the skin by the near passage of a current of high potential. My opinion is confirmed in this respect by my having frequently noticed (when examining a nude patient with the screen) that an electrical discharge is to be felt upon the surface of the skin. On passing the hand over the skin of a patient in close proximity to a highly charged Crookes' tube, a distinct crackling (not unlike that felt on stroking a cat's back when lying before a fire) is distinctly felt. This is the most noticeable in patients who have dry skins, and is entirely absent in those with very moist ones.

I would like it to be understood that I make these observations tentatively, with a full knowledge that sooner or later I may have to withdraw them. Our knowledge of the action of all rays is small, and of the X-rays in particular. Continued investigation and observation will undoubtedly bring to light new facts, and in the future we may be able to discuss the therapeutic action of the X-rays with some credit to ourselves and some benefit to our patients.

VAGINAL CŒLIOTOMY.[1]

By J. A. C. KYNOCH, M.B., F.R.C.P.Ed., *Professor of Midwifery, St. Andrews University, Obstetric Physician and Gynæcologist, Dundee Royal Infirmary.*

WITH the abandonment of Freund's abdominal operation, and its substitution by vaginal extirpation of the uterus, we had demonstrated for the first time the facility of entrance into the peritoneal cavity through the anterior or posterior vaginal fornix.

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[1] Read before the Edinburgh Obstetrical Society, 13th December 1899.

The abdominal operation introduced in 1878 was followed by such a high rate of mortality, that the more favourable results obtained by the vaginal operation with its improved technique, led to the latter being almost universally adopted. Lately the pendulum has swung in favour of the abdominal route in the treatment of cancer of the cervix, but the results do not yet warrant our substituting it for the vaginal operation.

As far back as 1857, Atlee opened and evacuated a collection of purulent fluid with subsequent separation of adhesions through the posterior fornix. The case was not published in detail, but from the short description given of it by Goodall, it would appear to have been a case of suppurating ovary or cyst, with removal of the sac in detached pieces. In 1870, Thomas performed and described the technique of vaginal ovariotomy, and we have at the same time the report of a case of suppurating cyst, similarly treated by Goodall; a dermoid cyst the size of an orange, by Battey; and simple cysts removed by Davis, Gilmore, and Wing, making in all a record of six vaginal ovariotomies about this period.

Goodall in his paper states that the indications for the operation must be limited, and that it cannot replace abdominal section, although the latter may follow the vaginal operation when it cannot be completed, and he points out the advantage of good drainage obtained through the vaginal incision.

About this time such startling records of success by abdominal section were forthcoming, that the vaginal operation fell into oblivion to such an extent, that Hegar and Kaltenbach, in the edition of their book on "Operative Gynæcology," published in 1881, stated that the vaginal operation need only be considered of use in those rare cases where a small ovarian tumour was found associated with vaginal prolapse.

With Müller's proposal, in 1882, of splitting the uterus vertically, to facilitate its removal, and that of Fritsch, in 1886, of opening the vesico-uterine pouch, as an early step in extirpation of the uterus, we see indications of advancement in technique favouring the adoption of the vaginal route. In 1887, Gusserow treated pelvic hæmatocele by vaginal incision. About the same time, Doyen pointed out the importance of the vesico-uterine space in pelvic surgery, when he published a record of 100 cases of pelvic disease so treated.

Sänger, when discussing the treatment of retroflexion of the uterus in 1888, suggested, but did not at first carry out, vaginal fixation, by making an incision through the anterior fornix and fixing the fundus to the vaginal wound. In 1892, Mackenrodt carried out Sänger's suggestion of vaginal fixation, by first fixing the fundus to the vaginal wound without opening the peritoneum, but, finding the results unsatisfactory, he subsequently opened the pouch, and fixed the fundus to that part of the peritoneum covering the bladder. In 1893, Dührssen proposed the name "vaginal laparotomy" for an operation he had performed for retroflexion in 1890, and from 1893 onwards, systematically, and with increased frequency, reporting 182 cases so treated, and extending the indications for anterior colpotomy to removal of myoma from the uterine wall, and diseased appendages. About the same time Martin wrote in favour of the operation. The publication of the English translation of Dührssen's book made his operations and methods known in this country, so that the limitations and indications for the vaginal route have already been frequently discussed.

I shall not take into consideration at present cases of vaginal hysterectomy for uterine disease or pelvic suppuration.

TECHNIQUE.—It will be unnecessary for me to describe in detail the steps of an operation which essentially consist in those adopted in the first part of vaginal hysterectomy. The importance of taking the same precautions in preparing the patient for vaginal as for abdominal section, will be shown when referring to some cases, and also the necessity of rendering the uterus as aseptic as possible by preliminary curetting when there is any fœtid uterine discharge. As with abdominal section, the operation of vaginal cœliotomy may be considered as having three steps: (1) Opening into the abdomen; (2) removal or examination of diseased organs; (3) closure of the vaginal wound completely or partially to permit of drainage.

1. The opening into the abdomen may be carried out through the anterior fornix (advocated by Dührssen), posterior fornix (Mackenrodt), or by adopting either route according to the position in the pelvis of the part to be operated on, as recommended by Wertheim. Personally I prefer the posterior incision.

In anterior colpotomy the incision may be transverse or longitudinal, the latter being more favourable for the safety of the ureter. On pushing through the cellular tissue with the finger between the uterus and the bladder (easy in multiparous, but frequently requiring the aid of scissors in nulliparous patients), the peritoneum is exposed and divided. I puncture the peritoneum with long sinus forceps, and open the wound to the desired extent. The fundus uteri and its appendages may be brought through the opening, examined by inspection, and if any of the parts have to be removed, the broad ligament may be ligatured and divided. Traction on the fundus through the posterior fornix is to be avoided, on account of the risk of injuring the bladder.

Drainage, if deemed necessary, is best carried out through the posterior incision. If not, the wound may be completely closed. In my own practice I introduce an iodoform gauze drain, which is removed in twenty-four hours, and leave the wound to close without sutures. The after-treatment is the same as for vaginal hysterectomy.

INDICATIONS.—1. *Retroflexion of the uterus.*—Although attempts had previously been made to retain the uterus antiverted by vaginal fixation, in cases not amenable to pessary treatment, it was only with the elaboration of the operation as suggested by Mackenrodt and Dührssen that this operation for retroflexion came to have more than a limited trial.

Few will probably admit the necessity for the frequency with which those Berlin gynæcologists resort to this plan of treatment in uterine displacement. In support of his claim, Dührssen quotes a collection of cases by Neugebauer where harmful results were produced by neglected pessary treatment. Of those cases Neugebauer states that eight died from sepsis and peritonitis as the direct effect of the pessary, and eight developed cancer (supposed to have some connection with the long-continued irritation of the pessary).

He further reports—

23 cases of perforation into bowel.
20 „ „ „ bladder.
10 „ both viscera perforated.
2 „ uretero-vaginal fistula.
4 „ perforation into pouch of Douglas.
6 „ „ of uterus.

Against these unfavourable results as the consequence of neglected pessary treatment, must be reckoned the constantly increasing number of reported cases where operative interference (including Cæsarean section) has been found necessary in cases of labour following on vaginal fixation.

I have myself treated two cases of mobile retroflexion of the uterus by Dührssen's method of vaginal fixation, where the leading symptoms (pain and dysmenorrhœa) had not been relieved by prolonged pessary and general treatment. Both patients improved, the uterus remains in its normal position, but as pregnancy has not occurred in either case, the most important question of its effect in labour in estimating the value of this plan of treatment cannot be judged of by those cases.

2. *Inversion of the uterus.*—In cases of inversion where reduction by ordinary means fails, and before resorting to the more radical treatment of amputation of the uterus, Kustner first suggested the introduction of the finger through a posterior vaginal incision to dilate the constricting ring.

He has reported several cases where this method alone or combined with an incision through the posterior uterine wall succeeded. More recently still, Kehrer reports a case successfully treated by anterior colpotomy, with vaginal fixation of the uterus. Spinelli believes that retroversion with fixation frequently follows posterior colpotomy, and for this reason Kehrer adopted the anterior route. Struthers last year reported a case which Dr. Hart had successfully treated by posterior colpotomy.

3. *Chronic ovaritis with adhesions (perimetric).*—This was the first indication for which Dührssen recommended the vaginal route, to enable him to remove adhesions matting together the pelvic organs. He combined the operation with vaginal fixation in cases of retroversion, regarding the latter proceeding as helpful in preventing subsequent adhesions.

The presence of adhesions frequently causes no symptoms, as shown by their being found in post-mortem examinations of cases where no pelvic trouble had been complained of during life. Yet pelvic pain in many cases appears to have no other cause.

If the adhesions be recent, they may be removed by bimanual manipulation, as practised by Schultze and Thure Brandt. When a spectator of this plan of treatment by Thure Brandt some years ago, the impression I formed was rather that of a gymnastic display than a method ever likely to be adopted in this country.

If the adhesions are of long standing, abdominal section has frequently been performed.

The following are illustrative cases treated by vaginal section:—

CASE 1.—Patient, æt. 23, complained of backache, aggravated by movement of the bowels, dating from an abortion twelve months previous to admission to hospital; last confinement two and a half years before that. On examination, uterus anteverted and enlarged, left ovary enlarged, with extreme tenderness on pressure here—*anterior colpotomy.*

Both ovaries adherent, adhesions separated by one finger introduced through the anterior fornix, the other hand acting through the abdominal wall. Both ovaries being found apparently unaffected, were returned, and the operation completed.

CASE 2.—Patient, æt. 28, pain in left side and dysmenorrhœa of three years' duration, married eight years, three children, had been under prolonged treatment by douches and rest with little effect—*posterior colpotomy.* Left ovary fixed, right easily drawn down and inspected, adhesions surrounding left ovary removed by manipulation, and organ replaced.

CASE 3.—Patient, æt. 40, pains left side and back, of ten years' duration, dating from a confinement at that time; under treatment by douches and rest on two occasions for six weeks with only temporary benefit—*posterior colpotomy.* Both ovaries fixed by adhesions, which were separated, and organs returned.

RESULTS.—In the first case, twelve months after the operation, the report is satisfactory; in the second case, dysmenorrhœa is relieved, but there is still pelvic pain complained of; and in the third case the result was complete relief two years after operation.

Case 2 illustrates the difficulty in deciding what treatment to adopt in cases where pelvic pain, associated with fixed ovaries, persists after prolonged general treatment.

Such a case might come under those referred to by Hart when speaking of abdominal section for tubal disease, in a recent address, where he says: "While a low mortality is a *sine quâ non* in such, we must not forget that an important point is to find out whether in the long run the ultimate result has, in non-suppurative cases, justified the mutilation. This holds especially true for neurotic cases."

4. *Prolapse of the ovary.*—In the treatment of this condition, if the ovary be movable and associated with backward displacement of the uterus, the introduction of a pessary frequently suffices to give relief. If fixed, and palliative treatment fails, the removal of the ovary may be justifiable, as in the following cases:—

CASE 4.—Patient, æt. 18, complained of intense pain on defæcation, of six months' duration. The uterus was retroflected, left ovary enlarged and prolapsed below it. Pessary treatment greatly aggravating the condition; the ovary was removed by posterior colpotomy, and the uterine displacement subsequently treated by a pessary, with complete relief of symptoms.

CASE 5.—Patient, æt. 28; backache; dysmenorrhœa, dating from confinement four years previously; uterus retroverted, with an enlarged prolapsed ovary on the left side. Treated for three years with pessary and plugs without relief—*posterior colpotomy*. Ovary removed, patient relieved, and able to wear a pessary with comfort.

EXTRA-UTERINE PREGNANCY.—The route to be adopted here depends on the nature of the case. If the symptoms point to a diffuse hæmorrhage from intraperitoneal rupture, without the formation of an hæmatocele, it is universally agreed that abdominal section, immediate, or as soon as the patient has rallied from the state of primary collapse, is the only treatment.

If the condition be diagnosed before rupture up to the eighth or tenth week, the intact tube may be removed by vaginal section. Dührssen gives a table of nineteen cases operated on through the anterior fornix, most of them being cases of incomplete tubal abortion, with one death. Becker and Donald likewise report successful cases. Mackenrodt reports six successful cases operated on through the posterior fornix, removing the affected tube in each case.

In cases first seen after the formation of a hæmatocele, the line of treatment is one on which there is diversity of opinion. Many such cases get well without treatment, absorption slowly taking place. This, however, may require several months, during which time suppuration of the hæmatocele may occur, or pressure symptoms may continue. On this account some recommend abdominal section in all cases of hæmatocele where the symptoms point to ectopic pregnancy as the cause. Kustner is of opinion that it is not advisable to operate through the vagina in any case, as the parts are not so readily seen as from above. In this opinion he is supported by Sänger, Fehling, and others. In retro-uterine hæmatocele, when the pouch of Douglas is distended with blood, and causes symptoms, posterior vaginal section is probably the best line of treatment. This is approved of by Fritsch, Zweifel, and Kelly. The advantages stated by Kelly are—(1) Tubes and ovaries are preserved; (2) clots are removed without opening up the general peritoneal cavity; (3) the operation is practically free from danger.

Of twelve cases reported by him so treated, however, he had to open the abdomen once in order to arrest hæmorrhage from the sac.

The following are short notes of two cases of pelvic hæmatocele treated by vaginal incision:—

Case 6.—Patient, æt. 22, complained of abdominal pain and vaginal hæmorrhagic discharge of three weeks' duration; three children, youngest eight months. Symptoms appeared suddenly ten days after expected date of menstruation. On examination, uterus was felt above the symphysis, and pushed to the front by a hard tender swelling felt through the posterior and left lateral fornix; temperature 101°, pulse 120. *Posterior fornix* incised, clots removed, cavity irrigated with sterilised water, and plugged with iodoform gauze; no trace of ovum found. Patient left hospital ten days after admission, and subsequent history is that of no pelvic trouble and another normal confinement.

Case 7.—Patient, æt. 29, pain in lower part of abdomen and left side, with vaginal hæmorrhagic discharge of *six weeks'* duration. Symptoms came on suddenly after six weeks' amenorrhœa; one child seven years old. On examination, a swelling, size of cocoa-nut, behind and to the left of the uterus; incised through posterior fornix, irrigated and drained with gauze, removed on third day. Patient left hospital by her own desire on tenth day, feeling quite well. On examination three days later, there was still a slight swelling felt in the posterior fornix, with vaginal hæmorrhage. Fortnight later she was quite well, and nothing felt on pelvic examination, which condition continues now, fourteen months after operation.

Ovarian Cysts.—Reference has already been made to the removal of small ovarian cysts through the posterior fornix by Atlee in 1857. This route has now been reintroduced for the removal of ovarian tumours, although not with universal favour.

Schauta reports twenty-three cases of ovarian cysts removed through the anterior fornix, with one death. He limits the cases suitable for the vaginal operation—(1) To movable tumours; (2) to those free from adhesions to the bowel; (3) to those non-malignant in character (malignant tumours not readily admitting of reduction in bulk). As it may, however, be difficult or impossible to diagnose those contra-indications before operation, the number of cases suitable for removal by this route must, according to this authority, be very limited.

Bumm reports five cases so treated; in one case the uterus had to be removed to arrest hæmorrhage, and in another the operation had to be completed by abdominal section. Wertheim reports two cases of large intra-ligamentary cysts removed through the vagina without opening the peritoneum. Fehling operated on seven large cysts through the anterior fornix, but is not a partisan to the operation, on account of his inability in some of the cases to complete the operation by the vaginal route. Wound infection is regarded by some as the chief contra-indication to the vaginal operation. Mackenrodt and Lohlein both publish a list of successful ovariotomies through the posterior fornix, the tumours varying in size up to that of a child's head. In this country, Donald, in support of vaginal ovariotomy, records twenty cases, with one death (hæmorrhage), and regards it as the better route in the removal of all cysts reaching as high as the umbilicus, and in the absence of indications of adhesions to the anterior abdominal wall.

My own experience of vaginal ovariotomy has been limited to the removal of cystic tumours not exceeding a lemon in size.

CASE 8.—Patient, æt. 27, complained of bearing down pains of three years' duration; three miscarriages, no full-time children. On examination, a movable swelling, the size of a turkey's egg, was felt to the left and behind the uterus.

Operation.—Posterior vaginal incision, dermoid cyst enucleated, pedicle ligatured and iodoform gauze drain introduced, a febrile recovery; left hospital in fourteen days.

CASE 9.—Patient, æt. 18, married eight months, complained of dysmenorrhea, frequent and painful micturition. On examination, movable tumour, size of an orange, felt behind the uterus. Posterior vaginal incision, a papillomatous ovarian cyst removed, operation completed as usual, a febrile recovery; discharge on the fourteenth day.

CASE 10.—Patient, æt. 32, admitted to my ward from O. P. department on account of a hæmorrhagic discharge following an early abortion. On examination under chloroform, with a view of ascertaining and removing the cause of the menorrhagia, a cystic movable swelling, the size of a Tangerine orange, was felt behind the uterus. The uterus was curetted and plugged with iodoform gauze, followed by posterior colpotomy, to remove what proved to be a unilocular ovarian cyst. The patient had *not* been prepared with the same precautions as for abdominal section. The result was that on the following day there was abdominal tenderness; pulse 116, temperature 102°. Next day tympanites and increase of abdominal pain; pulse 122, temperature 102°·4. She had now the appearance of commencing septic peritonitis, and was ordered an enema containing ℥ii of spirits of turpentine. This was followed by rather severe diarrhœa lasting several hours, but accompanied by improvement in general condition of the patient, which continued, and patient was discharged one month after admission.

IN DISEASES OF THE APPENDAGES.—With Pean's proposal in 1886 to remove the uterus *per vaginam* in suppurative conditions of the appendages, originated the idea of removing them through the anterior or posterior fornix without extirpation of the uterus. That the uterus is unaffected to any serious extent in many such cases, is shown by the frequency of pregnancy following unilateral removal of diseased appendages, and any inflammatory condition of the endometrium accompanying tubal disease can, in most cases, be satisfactorily treated through the dilated cervix.

In 1891, Lwoff reported twelve cases of tubal disease treated by posterior colpotomy, and Teploff about the same time published twenty-seven cases. In all, the appendages were deep in the pouch of Douglas and adherent.

Mackenrodt advocates the posterior incision, and quotes in its favour five successful cases, while Dührssen reports a long list of cases treated through the anterior fornix.

He regards the cases as most suitable for vaginal extirpation —(1) Those where the tubal swelling is mobile; (2) adherent, but lying low in the pouch of Douglas, and free from adhesions to the lateral pelvic wall.

Smith reports eleven cases of vaginal cœliotomy for diseased appendages, including six cases of pyosalpinx. Of the latter, three recovered, two died, and in one it was necessary to complete the operation by abdominal section.

The difficulty in accomplishing the complete removal of tubal swellings through the vagina on account of adhesions, with the risk of injuring adherent viscera, is exemplified by the two following cases:—

CASE 11.—Patient, æt. 31, was seen by me three years ago, complaining of more or less constant pain in the left iliac region, present previous to, but aggravated since, her marriage two years before coming under observation. She had not been pregnant, and there was no evidence to be obtained pointing to gonorrhœal infection. On examination, there was found what I supposed to be an enlarged tender left ovary. I regarded the case as one of ovaritis not requiring operative treatment, and ordered rest and douches. This treatment she carried out for a couple of months, when she resumed her household duties for eighteen months, during which period there was still pelvic pain complained of.

Three weeks previous to my seeing her for the second time, the pain had become greatly aggravated. On examination, I found extreme tenderness in the left iliac region, with general abdominal tenderness; temperature 104°, pulse 136. *Per vaginam* there was found a tender oval swelling behind and to the left of the uterus. This I regarded as a pus tube or suppurating ovarian cyst. On the following day I opened the posterior fornix, with the hope of removing the swelling, which proved to be a pus tube with adherent ovary. During my manipulations to separate adhesions, the tube burst, with escape of fœtid pus through the vaginal wound. After irrigating with sterilised water, I made further attempts to separate firm adhesions to the rectum, but as I saw risk of tearing the rectal wall, I sutured the edges of the tubal opening to the vaginal wound and plugged with iodoform gauze. This I removed on the third day, and replaced it with a drainage tube, retained for ten days. The discharge gradually ceased, and in six weeks the patient was able to resume household work. Her condition now, one year after operation, is quite satisfactory. There is no pelvic pain. Menstruation is regular and painless.

Case 12.—Patient, æt. 24, married five years, no children, attended my O. P. department, complaining of left-sided pain and backache, dating from shortly after marriage, and aggravated by menstruation. Clear evidence of gonorrhœal infection. *Per vaginam* there was found a cystic mobile swelling behind and to the left of the uterus, about the size of a hen's egg, regarded as probably tubal. *Posterior colpotomy* showed it to be a hydrosalpinx (left-sided), having all the appearance of a coil of small intestine. It was extremely thin-walled, and, during manipulation to ascertain its connections, it burst, with escape of clear watery fluid. It was adherent above. I made no further attempts to remove it, as from the thinness of the walls and nature of the fluid I did not consider this would be any great advantage. I stitched the opening to the vaginal wound. The results so far, eight months after operation, are satisfactory. On examination now, there is no pelvic pain or trace of pelvic swelling.

With regard to myoma of the uterus, I have not yet seen a case which warranted enucleation through the anterior or posterior fornix. Dührssen reports eighteen cases of small myomata so treated, with two deaths, but those were complicated with suppurative disease of the appendages. The difficulty in accepting this plan of treatment is obviously the rarity in such cases of symptoms demanding operative interference.

The remaining conditions which may be treated by the vaginal route are—

1. In cases of phthisis, cardiac affections, and other conditions likely to be aggravated by subsequent parturition. Dührssen advocates and reports eighteen cases where the tubes were exposed, ligatured, and divided by anterior colpotomy.
2. For diagnostic purposes, as, for example, in cancer of the cervix, to ascertain the extent of glandular infection, as recommended by Martin.
3. Cases of perforation of the uterus, formerly treated by extirpation, by opening either through the anterior or posterior fornix; the wound may be exposed and sutured.
4. Tubercular ascites; Lohlein reports six cases treated by incision through the posterior fornix. In five of these the result, one year after operation, was satisfactory, as regards general condition, temperature, and non-recurrence of abdominal swelling.

Advantages claimed for the vaginal over the abdominal route are—(1) Shorter convalescence—fourteen days as compared with three to four weeks; (2) no abdominal cicatrix, therefore no risk of hernia, or subsequent formation of intestinal or omental adhesions; (3) less shock, on account of the peritoneum being less exposed: (4) drainage, if necessary, is best carried out through the posterior fornix.

Its drawbacks are—(1) On account of the limited space, dense adhesions are more difficult to manage, and consequently greater danger of wounding viscera (bladder and rectum); (2) greater difficulty in rendering the vagina aseptic. The latter objection, however, is probably exaggerated.

Cases suitable for the vaginal route (other means of treatment failing) I believe to be—(1) Mobile retroflexion, causing symptoms at or about the menopause; (2) chronic ovaritis with adhesions; (3) prolapse of the ovary with fixation; (4) ovarian cysts, if small, whether dermoid, simple or papillomatous; (5) pelvic hæmatocele; (6) unilateral, mobile, tubal swellings.

Cases unsuitable for this treatment are—(1) Large tumours; (2) old standing tubal disease with dense adhesions, where the complete removal of the appendages is necessary.

CLINICAL RECORDS.

PAPILLOMA OF THE TONGUE, WITH FEATURES SUGGESTING CARCINOMATOUS CHANGE. SUBSEQUENT RECURRENCE IN SUBMAXILLARY LYMPHATIC GLANDS.

By Grant Andrew, M.B., F.F.P.S.G., *Assistant Surgeon to the Victoria Infirmary, Glasgow.*

This patient, R. F., æt. 59, was admitted to the Victoria Infirmary on the 19th August last, complaining of a tumour on his tongue. His trouble began five months before his admission, by the occurrence of a little pimple on the dorsal aspect of the tongue near the tip. He thought it was caused by his pipe, as he smoked a great deal. The pimple did not disappear in the usual course, but became gradually replaced by a warty-looking growth, which slowly but certainly increased in size.

For a time he paid no attention to it, as it caused him little or no discomfort; but after some weeks, and as it was getting larger, he showed it to his doctor, Dr. M'Gilivary. The doctor, who was attending him at the time for a purpuric condition, prescribed for him, and treated it locally by painting and afterwards by scraping. No form of treatment seemed, however, to have any effect, and he was sent to the Infirmary.

Condition on admission.—The tumour was situated on the dorsal aspect of the tongue in its anterior third, and though almost in the middle line, projected slightly to the left. Somewhat oval in shape, it measured 1½ in. in length, ¾ to 1 in. in breadth. There was nearly an inch of healthy tissue between the growth and the tip of the tongue.

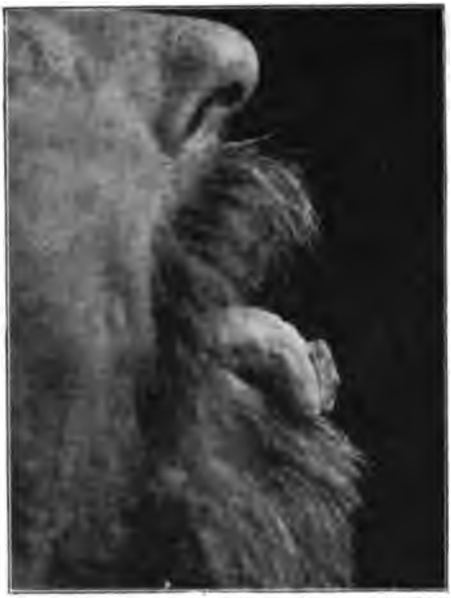

FIG. 1.

The edge of the tumour could be raised all round to a varying extent; it was impossible to appreciate any difference in consistence between the deep attachment of the tumour and the tumour itself. The surface was irregular, warty-looking, and here and there presented small areas of excoriation which bled if touched. The tumour was quite soft, freely movable, and caused him no inconvenience except when irritated in the process of mastication or when the stem of his pipe rubbed against it. The remainder of the tongue was healthy; there was no evidence of superficial glossitis. His breath was not fœtid.

In the right submaxillary region an enlarged gland was felt, small in size and freely movable. Patient was quite decided, however, that this enlarged gland had been there for years, but had perhaps got a little bigger and harder since the tumour appeared on his tongue. He was pallid, but there was no cachexia.

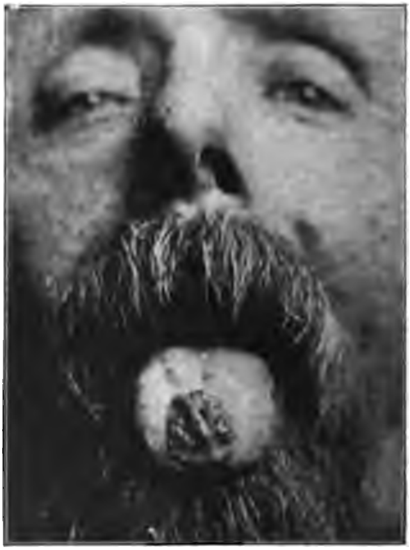

FIG. 2.

The interest of this case lay in the diagnosis. Was this a simple growth? If a simple growth primarily, was it now malignant? The treatment depended upon the diagnosis. Were we to remove the entire tongue or simply to excise the tumour?

The possibility of its being specific was excluded for various reasons, but chiefly because there was no history or evidence of past mischief, and the fact that iodide of potassium had been pushed to the extent of inducing iodism, without any material alteration in the size of the growth.

The general appearance of the tumour, its situation, its size,—if such a tumour were cancerous from the beginning, there would have been pronounced cachexia,—the absence of pain, induration, fixation, ulceration, and of marked glandular implication, led us to the conclusion that primarily, at any rate, this growth was simple, and that it was a papilloma.

Was it now, however, undergoing an imperceptible change and assuming a carcinomatous type? Naturally, from the age of the patient, we thought that to be likely, but there was no evidence of such a change. Microscopic examination of a scraping yielded a negative result.

The tumour was readily exposed and easily excised by securing and drawing forward the tongue with a stitch. The line of incision was kept well free of the growth all round, and in depth quite close to the under surface of the tongue. The cut edges were brought together and secured with sutures. The enlarged submaxillary gland was also removed. Section of the gland showed evidence of caseous degeneration. The wound in the tongue healed *per primam*.

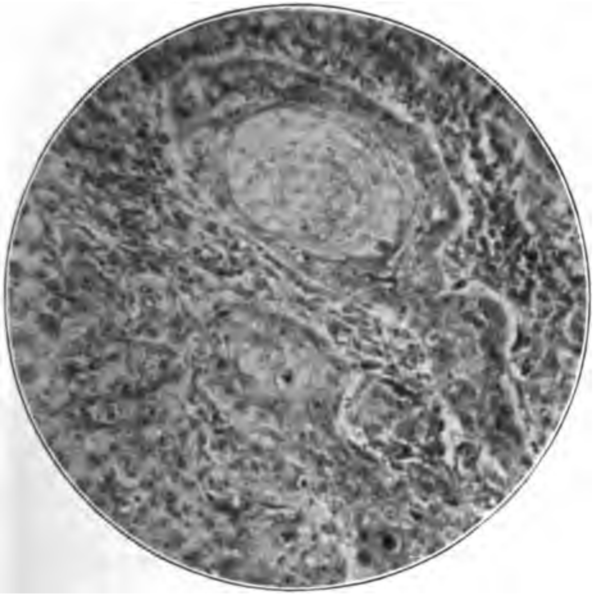

FIG. 3.

Histological report.—"The tumour mass is shaped like a flattened mushroom, and has a broad neck and pedicle. The surface is uneven, being eroded superficially in places, both on the flattened top and on the pedicle. The mass is found to be composed of epithelial tissue, and elements which are evidently chronic inflammatory, with a small amount of muscular tissue. The epithelial structure forms a thick uneven layer, which covers completely, and sends down into the interior of the mass, elongated processes which contain many laminated capsules (Fig. 3). These processes are highly irregular in form, being thick and frequently bulbous at the lower extremity, and having very much constricted necks. In some instances the process is broad, but usually they are very narrow. The epithelium is of squamous type. The inflammatory elements are usually found to be round-celled exudation near the ends of and between the processes, but becoming transformed into spindles and fibres in the deeper layers. A gland sent down is found to be invaded by nodules of typical epithelioma, in which laminated capsules are found (Fig. 4).

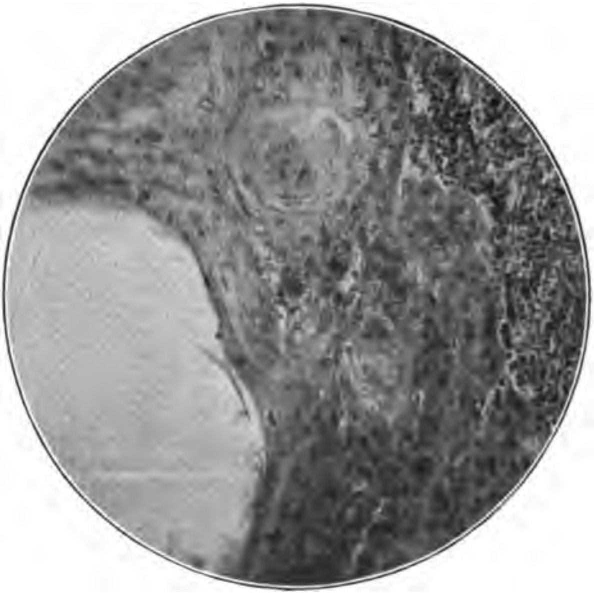

FIG. 4.

"The epithelial growths are all superficial, and are clearly defined from the gland." DR. LESLIE BUCHANAN.

About a fortnight ago, three months after leaving hospital, he came back to see us.—*December* 1899.

The tongue had remained free from recurrence. On each side of the neck, however, in the submaxillary region, the glands could be felt quite perceptibly enlarged and firmly anchored, plainly establishing their malignancy. This was found to be the case on attempted removal on the left side. Every structure seemed connected with the implicated chain of glands. It was impossible to separate the sterno-mastoid in front, which had to be divided and removed, as had also that portion of the internal jugular vein which corresponded with the line of the glands below. As the affected chain of glands followed the vein right up to the base of the skull, it was regarded as hopeless to attempt removal on the opposite side.

"Microscopical examination of the glands removed showed marked evidence of epitheliomatous implication, with evidence of old healed tubercular mischief." DR. ANDERSON.

In Butlin's "Diseases of the Tongue," p. 248, the following passage occurs:—"In persons advanced in life, especially in men, there is danger lest a papilloma should be mistaken for an epithelioma; or rather, the danger is lest the epithelioma should be mistaken for a simple papilloma, a much more serious error. The diagnosis is all the more difficult because the simple growth may be transformed into a carcinoma. . . . The diagnosis of innocent warty growths from warty carcinomas, and the suspicion that a simple warty tumour is being transformed into a carcinoma, will depend first and largely on the age of the patient. . . . Next to age, but not second to it in importance, is the condition of the structures at the base of the growth: beneath a simple papillary tumour they are quite soft and natural; beneath and around a carcinoma they are infiltrated, stiff, and, as the disease advances, widely indurated. The value of this subjacent induration cannot be overestimated. Ulceration, granular affection, the microscopical examination of a scraping of the surface . . . are symptoms belonging to a later period of the disease, and are of little value in deciding between a warty tumour and an epithelioma in an early stage."

I do not think there is any doubt that in this case we had to begin with a simple growth, a papilloma. Had it been carcinomatous from the beginning there would certainly have been that "subjacent induration," ulceration, and pronounced glandular implication which were conspicuous by their absence.

Everything, moreover, favoured carcinomatous change, the age of the patient, the situation of the tumour, etc., but which took place so insidiously as to cause us to doubt whether it had yet occurred.

It is interesting to note that no recurrence took place in the tongue or in the immediately subjacent tissues; the glands must have been implicated, though not palpably so, at the time of the original operation.

There is the question, of course, whether a more radical operation primarily would have eradicated the disease; this was decided for us in this case by the patient himself,—he would not submit to an operation other than for simple removal of the growth.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

Lehrbuch der Nervenkrankheiten. Von Prof. Dr. H. OPPENHEIM in Berlin. With 287 Illustrations. Second edition. Berlin: S. Karger.

THE second edition of this admirable text-book of nervous diseases, by so experienced and original an observer as Professor Oppenheim, can be strongly recommended for its clearness and comprehensiveness to all students and physicians who are able to read German; and doubtless an English translation would be produced had we not already a standard classical work by Sir William Gowers. The book, which has been considerably enlarged, now comprises nearly a thousand pages; it is divided into a general and special part; the former deals with the methods of research and observation, also general symptomatology. A chapter on muscle function, illustrated by photographs, showing the effects of paralysis of various muscles and groups of muscles in patients from Professor Oppenheim's clinic, together with a chapter on the methods of testing the electrical reaction, will be found especially valuable. In the chapter devoted to disturbances of sensibility, it was somewhat disappointing to find no allusion to the work of Ross, Mackenzie, and Head upon referred pain.

The special part deals first with diseases of the spinal cord, and this comprises 200 pages. One chapter may be singled out as of special interest and value; it is that on tabes dorsalis, in which Oppenheim's own valuable observations are recorded, notably atrophy of the solitary bundle and the spinal root of the fifth in a case of tabes. The author states that the agent producing tabes acts primarily on the spinal ganglia and their homologues (gang. gasseri jugulare, etc.), injuring them without producing structural changes, and this produces a progressive atrophy, which, commencing at the spinal terminals of the neurons, extends back along the roots to the ganglion cells; also a degenerative atrophy, sometimes occurring at the terminations of the peripheral nerves, and extending upwards towards the spinal ganglia. This is really Marie's view, but slightly modified by the author's own observations that in some cases the homologous cranial nerves may be affected. There is also an instructive chapter on combined sclerosis; the author states that he has had the opportunity of examining a case of combined lateral and posterior sclerosis occuring in a juvenile patient. This case, however, differed from Friedreich's disease, inasmuch as there was optic atrophy and reflex iridioplegia. Besides the spinal sclerosis, there was found atrophy of the descending root of the fifth and of the Westphal Edinger nucleus. In another case, however, of reflex iridioplegia the nucleus was not affected. Still the observation is of much interest.

It may be noted that the reader will find an interesting and important chapter on syphilitic spinal meningitis. The author rightly leaves an open question, whether myelitis can be associated with the infection of micro-organisms and their toxins? The different forms of multiple sclerosis are discussed very fully, and the importance of the visual disturbance and the partial optic atrophy is emphasised as a means of diagnosis. The very important observations of Buzzard upon this subject are not alluded to.

The next 200 pages are devoted to a good account of the diseases of the peripheral nerves. In consideration of the important colonial development of Germany, it was rather surprising to find only the briefest reference to Beri-beri. In an interesting chapter on polymyositis, a knowledge of which we owe mainly to the observations of Wagner, Hepp, Unverricht, and Strumpell, the author points out that the disease is usually acute; heaviness in the limbs, headache, giddiness, and gastric symptoms arise, then severe pains in the muscles of the extremities, followed by swelling and pain on pressure, the shoulder and upper arm muscles being selected with especial frequency. The skin is generally reddened and the temperature raised, the respiratory muscles of the heart and muscles of deglutition may be affected; and death ensues from asphyxia, heart failure, or deglutition pneumonia. The cause has not yet been determined, but it is probably of an infectious nature. The symptoms closely resemble trichinosis, with which it might easily be confounded. Probably in the next edition Professor Oppenheim will refer to the interesting nervous phenomena that have been lately shown to occur as a result of eating bad meat and fish infected with the *B. botulinus.*

Three hundred pages, forty of which are devoted to the anatomy and physiology of the brain, form the next section. Especially interesting is the account of the oculo-motor nucleus and its subdivisions. Following this is an interesting general account of the symptoms of organic brain disease, which is divided into motor and sensory, the former being subdivided into irritative and paralytic phenomena. Sensory disturbances follow, and lastly, speech disturbances. A new feature in the second edition is a valuable table by which the different varieties of aphasia may be recognised by the presence or absence of the different forms of verbal and written speech. In the chapter on cerebro-spinal meningitis, Kernig's symptom is not mentioned; probably the importance of the diagnostic symptom had not been pointed out when the chapter was written, and it will appear in the next edition. There is an interesting account of poli-encephalitis, superior and inferior, and Oppenheim points out that acute hæmorrhagic encephalitis in the grey matter of the floor of the third ventricle and of the aqueduct of Sylvius, occurs, which leads to paralysis of the ocular muscles, the most important etiological cause being chronic alcoholism. It may also occur as the result of influenza. The reviewer has recently met with a fatal case of acute hæmorrhagic poli-encephalitis affecting the cortex cerebri in a chronic alcoholic, whose immediate cause of death was fatty degeneration of the heart. The chapter on infantile spastic hemiplegia and diplegia has been improved by additional matter and figures, likewise that on thrombosis of the cerebral sinuses. The subject of brain abscess in this edition is enriched by the experience of Macewen. Especially valuable contributions are the chapters on tumours and brain syphilis; Professor Oppenheim has devoted particular attention to these subjects, having written two classical monographs in Nothnagel's "System of Medicine." Some books on diseases of the nervous system give no account of general paralysis; it should, however, be looked upon as an organic brain disease, and the author has given an excellent account of it; and he considers it more and more evident that syphilis is the most important factor in its production, in support of which he cites the experiments of Krafft-Ebing, and the fact that children affected with congenital or acquired syphilis may afterwards develop general paralysis. The reviewer has recently published in the "Archives of Neurology" from the London County Asylums twenty-two of such cases.

The fourth section of the work is taken up with the neuroses, and about the first fifty pages are given to hysteria; as nearly all the figures are borrowed from French writers, it may be presumed that the multiple forms of this affection are not so common in North Germany as in France. The account is, however, very full and complete. Neurasthenia, a condition important enough nowadays for practitioners and neurologists, is carefully considered in all its aspects, and the remarks upon treatment will be found most useful. Associated with these two neuroses is a supplemental chapter upon the diseased conditions which arise in persons with neurasthenic, hysteric, psychopathic, etc., diatheses, agorophobia, folly of doubt, imperative ideas, etc. Traumatic neuroses, migraine, headache, and vertigo are next severally considered. Upon the subject of epilepsy, Dr. Oppenheim states that his experience supports that of Fournier, that epilepsy may arise as a result of acquired or inherited syphilis. Fifty pages given up to the different forms of localised muscle spasms, complete this section. Section 5 gives a good account of diseases of the sympathetic, the angio-neuroses, and tropho-neuroses. It includes also hemi-atrophia facialis, Graves's disease, myxœdema, and acromegaly. The last, section 6, of thirty pages, gives an account of toxic conditions affecting especially the nervous system, alcohol, morphia, tetanus, and head tetanus.

An up-to-date account of nervous diseases, their causes and treatment, by one who has made many important contributions to neurology, who has had such a large experience in practice and teaching, cannot fail to command the interest and respect of all neurologists, and certainly this second edition of Professor Oppenheim's text-book will meet with the brilliant success it deserves.

F. W. MOTT.

A Manual of Surgery. By CHARLES STONHAM, F.R.C.S., Senior Surgeon to the Westminster Hospital. London: Macmillan & Co. Ltd. 1899.

THIS work is intended as a manual for practitioners and students; it embodies the results of the author's experience as an hospital surgeon and teacher for sixteen years. It consists of three volumes. Of these, the first relates to general surgery, the second to injuries, and the third and largest, to regional surgery. From the student's point of view, the book is an excellent one, being concise and clear in its teaching, sufficiently dogmatic, and including within moderate compass a complete course of surgery; the more important injuries and diseases of the eye, ear, nose, skin, and female generative organs very properly receive their due share of attention, instead of being regarded as belonging exclusively to the specialist. The author's personal work and experience in morbid anatomy is revealed throughout the work, to its manifest advantage, and many of the original illustrations are drawn from the museums with which he has been associated. Controversial questions are lightly and agreeably touched upon, without wearying or mystifying the reader, and without the author committing himself to one or other side. Only a very small proportion of the very large number of illustrations are original, the latter are excellent; those borrowed from other sources, Follin and Ziegler especially, are so good in themselves, and so well reproduced, that the reader will not regard their extraneous origin as by any means a disadvantage. While it is easy for the reviewer to estimate the scope, arrangement, style, type, and illustrations of any work by merely glancing through its pages, it is a very different matter when he attempts to criticise the text in detail, and he is apt to direct his attention to subjects in which he is specially interested, and to carp at opinions or methods which are at variance with his own. The following criticisms are probably of this nature, but they have suggested themselves on looking through Mr. Stonham's text-book. The first volume makes an inauspicious start with an elementary description of degenerations, atrophy, and hypertrophy. The teaching value of the following chapter on ischæmia, anæmia, venous congestion, and inflammation, is of doubtful quantity; these conditions have but little connection with one another; inflammation is dealt with on the lines laid down by Burdon Sanderson; the opposing views of other pathologists, remarks on the physiology of heat and on the production of fever and other matters, are added, which are scarcely in their proper place in a student's text-book of surgery. Chronic abscess is very well described under the head of suppuration, but its description might well have been postponed until the whole subject of tuberculosis had been brought before the reader. There are very excellent chapters on ulceration, gangrene, surgical bacteriology, and surgical infective diseases. In the article on tumours, we find the common mistake of including all pigmented malignant tumours with the sarcomata without any suggestion of the epithelial origin of quite an important section. No mention is made of the occurrence of chocolate-coloured giant-celled tumours (myeloma) in tendon sheaths and bursæ, or of the generally recognised nerve origin and relationships of certain forms of molluscum fibrosum. The article on deformities very reasonably includes those of the body generally, instead of being confined, as is customary, to those of the limbs and spine; at the same time, it would appear to be preferable to consider the malformations of the genito-urinary organs and rectum with the regions concerned, for the author appears to have found himself compelled to restrict his observations on their treatment to the barest outline; this is specially evident in the treatment of ectopia vesicæ and of the malformations of the rectum and anus. We failed to find any mention of coxa vara, or of metatarsalgia, or of the transplantation of tendons.

The second volume, although nominally devoted to injuries, leads off with a chapter on antiseptic surgery. In looking through the article on injuries of bones, we find it stated of the common fracture of the clavicle, that "the bone is usually broken at the middle," which is vague; that "the chief reliance in diagnosis is pain and crepitus," which is a little hard on the patient; and that the treatment described is the method of plaster strips introduced by Sayre. For other methods, the reader is referred to a work on fractures. In the otherwise excellent article on injuries of joints, we find that the effusion which results from sprains is referred to as "acute synovitis," and that the application of cold is recommended "to subdue inflammation." We believe that this teaching is apt to mislead the student; he gets confused between the direct results of injury and the process of inflammation. Further, in dealing with dislocations, when complicated with fracture, we are told that, if one fails in reducing the dislocation, "the fracture must be set, and when it is soundly healed, a cautious attempt at reduction must be made." We never met anyone who has carried out this procedure, but we can imagine the result. Surely the proper treatment is to effect immediate reduction of the dislocation by open operation, and then treat the fracture. The chapter on amputations, while most comprehensive, makes no mention of the widely applicable elliptical method introduced by Kocher. The remaining chapters in this volume on the injuries of different regions, including one by Mr. Donald Gunn on injuries of the eye and their effects, are of a high standard of excellence.

The third volume, which is half as large again as the first or second, deals with regional surgery; as we might expect, from Mr. Stonham's wide experience as a hospital surgeon, it is the best of the series; the different articles are eminently practical and instructive. We must join issue, however, with the author's opinion of the surgical treatment of cancer of the stomach. We are told that "in cases of malignant disease requiring relief by operation, gastro-enterostomy should be preferred, for attempts at radical cure by removal of the growth have been *uniformly unsuccessful.*" No statement could be more at variance with the current facts of surgical progress. ALEXIS THOMSON.

The Diseases of Children. By HENRY ASHBY, M.B., F.R.C.P., and G. A. WRIGHT, B.A., M.B., F.R.C.S. Fourth Edition. London, New York, and Bombay: Longmans, Green, & Co. 1899.

WHEN a book has attained such a well-deserved popularity as Ashby and Wright's "Diseases of Children," it follows as a natural consequence that fresh editions are in constant demand. The widespread reputation which it has acquired may be attributed, we think, to several causes.

In the first place, it is a most complete and comprehensive treatise on disease as it occurs in children, and there are few, of even the rarer morbid conditions, which are not fully and carefully described. Secondly, the opinions of the authors are stated in plain, clear language, their desire being apparently to express their views in as simple a style as possible, and to avoid anything savouring of padding or unprofitable theorising. Thirdly, it is written almost entirely from a clinical standpoint, all pathological detail not absolutely necessary for a correct representation of the disease under consideration being omitted. Fourthly, every page conveys the conviction to the reader that this book is no mere compilation, but is the united experience of two earnest workers whose views have been carefully weighed and pondered before being committed to print. Lastly, and perhaps chiefly, it is the combined work of a physician and a surgeon, thus affording a wider and more comprehensive view of the subject than one treated purely from a medical or surgical standpoint.

In the chapter on rickets, for instance, after a very clear résumé of the causes and symptoms of this disease from a medical aspect, we have a most interesting account of the various forms of rickety spine, coxa vara, bow leg, and knock knee, and of the different methods by which they are produced, the consideration of which, together with their treatment by mechanical apparatus and by operation, clearly falls much more within the domain of the surgeon than of the physician. The value of collaboration is perhaps nowhere better demonstrated than in the discussion of the treatment of intussusception, where the various views are summed up in the following pregnant sentence: "The results of injection are uncertain, its use is dangerous, and delay in the reduction of the intussusception is so disastrous that probably many more lives would be saved by immediate operation than by any other treatment."

The opening chapters are devoted to the physiology of infancy and the diseases incidental to birth, all the morbid conditions occurring at this early period of life, with few exceptions, being carefully described. The chapter on hygiene and diet contains many excellent hints for the feeding of children, but is too condensed to do justice to such an important subject, and we regret to see even a modified approval given to the employment of Swiss milk and dried milk foods, all of which are at the best unreliable. The sections devoted to the diseases of the digestive system leave little to be desired, especially the chapter on the various forms of diarrhœa and their treatment. It is difficult to understand the reason for including post-nasal adenoids in this section, and also for omitting any mention of the very characteristic physiognomy which accompanies that condition.

The diseases of the respiratory system are admirably portrayed, particularly the pictures drawn of the pneumonias of childhood, and the impossibility of classifying many of the mixed or hybrid forms which are of such frequent occurrence in the early years of life. The difficulties in the diagnosis of empyema and the misleading nature of many of the physical signs are emphasised, and the necessity for the frequent employment of the hypodermic syringe for the purposes of diagnosis is insisted upon.

The pages of the book are plentifully besprinkled with illustrations, many of them very characteristic and instructive, but forming as a whole a somewhat gruesome picture gallery.

An admirable appendix, full of useful information, concludes a volume which will be universally welcomed as one of outstanding merit.

G. H. Melville Dunlop.

Mental Affections: An Introduction to the Study of Insanity. By John Macpherson, M.D., F.R.C.P.Ed. London: Macmillan & Co. Ltd. 1899.

After reading this book, we feel convinced that it is destined to take a very high place as a standard work on insanity. Dr. Macpherson's treatment of the subject is eminently fresh and original, but at the same time it is characterised by breadth of view, careful recognition of facts, and an intimate knowledge of the literature of the subject, both English and foreign. Much thought has evidently been devoted to a consistent and logical arrangement of an admittedly difficult branch of medicine so far as our present knowledge admits, and the result, though not in entire accordance with prevailing current views, is probably destined to become more and more generally accepted.

The book is divided into three parts—the first introductory, the second devoted to histology and pathology, while the third deals with clinical symptomatology and occupies considerably more than half the book. It is impossible to enter fully into a consideration of all the many interesting questions so ably discussed by the author, but the more important of them may be briefly indicated.

The first part is sub-divided into the subjects of morbid heredity, the evolution and the determining causes of insanity. In this section, and indeed throughout the whole book, much attention is given to the question of degeneration. It is defined as a change in nervous function associated with a morbid hereditary deviation from the normal type. It is in short a dissolution of normal heredity. Its causes are fully investigated, and are indicated as dependent mainly on disease. It is considered that the effects of disease may be hereditarily transmitted. Under the determining causes of insanity, while others are mentioned, most attention is given to those of toxic origin. The author's opinion is that there is a toxic basis in all forms of insanity, and in his classification of the various forms of this disease it plays a most important part. This view is steadily gaining ground as our knowledge of the chemistry of metabolism and of diseased processes extends, and will probably become still more prevalent. Of the various modes of toxic infection, most is said, though it must be confessed least is known, of auto-intoxication. The treatment of this subject, even if not quite convincing, is most suggestive. It opens out a wide field of enterprise which it is to be hoped will steadily gain in precision. There is no doubt it is the direction in which pathology is at present tending in its efforts to explain the causes of disease.

The second part of the book is concerned with physiological and pathological considerations. The structure of the cerebral cortex, the theory of the neuron, cortical localisation, and the most recent researches into the structural anatomy of the brain, are clearly and succinctly described. Two chapters are devoted to pathological mental symptomatology. Under this heading the physical and mental stigmata of degeneration are enlarged upon. Amongst the latter are mentioned defects of intelligence, of emotional and moral sense, and what are called by Magnan episodic mental syndromes. These include obsessions, phobias, indecisions, impulses, and perversions. An important discussion of cerebral dissociation then follows. A group of nerve elements may be affected in one of two ways. Its permeability to impressions may be either increased or diminished; in other words, its resistance may be either lowered or heightened. On this basis an attempt is made to explain some of the symptoms of insanity. In melancholia, for instance, it is supposed that resistance is increased, while in mania it is diminished. In both the initial disturbance is probably in the ideational centres of Flechsig. This general theory is worked out for other morbid mental manifestations, and is supported by clinical illustrations. It is of course largely a supposition, but it is most suggestive, and the value of philosophic hypothesis in the advance of science is too well known for this alone to be made a reason for rejecting it.

The third part of the book deals with clinical symptomatology, in other words, with the various forms of insanity. The classification adopted is a new one, but as in other parts of his work, so in this, the author shows his independence of mind, his habit of looking at things with his own eyes, and his power of constructing a logical and co-ordinated system from what he sees. The forms of insanity are divided into idiopathic, confusional or toxic, that of the degenerate, and that caused by brain disease. Under the first are included the ordinary forms of mania and melancholia, circular insanity, and progressive systematised insanity (paranoia). They are termed idiopathic because they arise as a general rule without any apparent external cause. This may be quite true, but there is no disguising the fact that the use of the term is more or less a confession of ignorance. It would have been better to have based the relationship of these forms of mental disease, even if undoubted, on some more positive and tangible grounds. In all the above forms, except the last, periodicity is a marked feature. The clinical varieties of mania and melancholia are shortly described. The chapter on progressive systematised insanity is specially well written, as was to be expected, Dr. Macpherson being known to have studied this subject most carefully.

The next class, that of toxic insanity, includes a large variety of diseases. They are all, however, characterised by mental confusion as the leading symptom. Their toxic origin is still in many cases matter of conjecture only, but such a basis of classification is at least suggestive. In this group are included the delirium of collapse, acute primary mental confusion, stupor, puerperal insanity, acute delirious mania, and general paralysis. Though the last of these is coming to be regarded by many as of toxic origin, it seems rather a straining of the term to say that its chief mental symptom is confusion. Alcoholism is, of course, also included in this class, as well as various other mental diseases associated with general bodily conditions, such as myxœdema.

The next two chapters are devoted to the insanity of the degenerate. Under this heading are included idiocy, imbecility, premature dementia, moral insanity of various kinds, systematised delusions, and *folie à deux*. An attempt, not completely successful, we think, is made to discriminate between some of these and similar idiopathic affections. The author, however, says he finds no difficulty in making the distinction practically. He lays stress on the presence and character of hallucinations in the two classes, and on the history of the evolution. He then passes on to a consideration of insanity associated with the neuroses, epilepsy, hysteria, and chorea. These also he thinks have a more or less toxic basis. He cites the observations of Haig and Krainsky on the excretion of uric acid in support of the toxic origin of epilepsy. In the last chapter is discussed the insanity caused by brain disease. In this he includes apoplexy, tumours, and syphilitic disease, traumatism, and sunstroke. Senility is also apparently included under this heading as well as secondary dementia. There seems room here for further effort to bring these into line with other very closely allied conditions.

Under each form of insanity a short account of its treatment is given. Mention may be specially directed to the advocacy of prolonged warm baths in excitement and insomnia, and to the washing-out of the stomach in many cases of melancholia.

The pathology of the various affections is succinctly described, special stress being laid on the importance of chromatolysis, especially in the toxic insanities.

Various printer's errors and a rather curtailed index we hope to see improved in a future edition, which will no doubt be called for. We have read the book with great pleasure and profit, and doubtless it will add much to its author's reputation as a sound and philosophic alienist.

J. MIDDLEMASS.

Traité de Microbiologie. By Professor E. DUCLAUX, Director of the Pasteur Institute. Vols. i. and ii. Paris: Masson et Cie. 1899.

THESE two first volumes of Duclaux's "Traité de Microbiologie" must be considered as part of a work of the first importance, both as regards the enormous amount of information which they contain, and as regards the ability and originality with which the subject is expounded. Following the traditions of the school founded by Pasteur, the author makes the action of micro-organisms as producers of chemical change the fundamental basis of the inquiry. And thus, on the one hand, the part played by them as pathogenic agents is treated as a special manifestation of this action, and, on the other hand, subjects such as structure and classification are rightly made subordinate to vital action. The field covered is, however, wider than is indicated by the title. For, in addition to microbiology, in the ordinary sense of the term, the non-organised ferments or diastases produced by the various cells in the vegetable and animal kingdoms are also included in the study. The work thus comes to be a treatise on fermentation in general, as well as of various kindred subjects.

The first volume is devoted to general microbiology—the biology of micro-organisms. The opening chapters are occupied with a historical survey of the development of the subject, dating from Pasteur's epoch-making discoveries,—the initial demonstration of the part played by organisms in fermentation and in disease, and the phases through which the study has passed. The change of attitude necessitated by the demonstration of the importance of modifying conditions in both these spheres of action is brought into prominence. The writer then passes on to the morphology of micro-organisms—both bacteria and the higher fungi—and to the method of study. The latter naturally includes the bacteriological methods, which are clearly and concisely described, though by no means exhaustively—such is not the object of the work. Nor is the systematic description of bacteria, etc., entered upon. The greater portion of the volume is devoted to the physiology of micro-organisms. Here there are very fully dealt with, subjects such as the alimentation of microbes, as regards both mineral and organic substances, life under aërobic and anærobic conditions, the results of modifying the environment, the effects of light, heat, electricity, etc. Micro-organisms of the air, water, and soil are also treated in the same general manner. In these various chapters, adaptation of microbic life, or the "plasticity of the physiological function," is kept prominently in view. This factor has necessarily altered the former conceptions of "species," this being defined, according to Duclaux, by the manner in which an organism behaves in the various cycles of existence which it goes through. This view, with which we agree, is as easily intelligible as the old one of comparatively fixed characters, but at the same time shows the necessary difficulty in recognising the various species.

The second volume is of even greater interest and importance than the first. It treats of diastases and their action. Advance in this department, especially during the last decade, has been very rapid, yet we may be said to be merely on the threshold of the subject, so far as the application of the obtained results is concerned. Duclaux makes it a guiding principle in this part of the work to analyse the so-called vital processes, and to determine the part played in them by diastases, *i.e.* dead substances. The result of such inquiry has been a gradual encroachment on the vital territory by the chemical. Recent work has shown that many of the chemical changes produced by bacteria and other fungi are due to diastases formed by them, one of the most striking discoveries being that of Buchner, who has separated a ferment capable of splitting sugar into alcohol and carbonic acid. How far such results can be carried is of course a matter to be determined in the future. One, however, naturally passes from the cells of these lowly organisms to those of the animal body, and inquires to what extent their vital action depends upon diastases. Duclaux points out that it has been demonstrated that the changes involved in the fundamental processes of alimentation—digestion and internal nutrition—and of respiration can be produced by diastases, and considers that in the various vital processes diastatic action will be found to intervene between the cells as units and their various functions. The special offices of the cells will thus be the formation of diastases. In this case the explanation of vital action is carried a step backwards, but it gains rather than loses in complexity. We cannot but think, however, that in some respects the views of the writer on this subject go farther than facts justify.

This second volume is divided into two parts. The first is concerned with diastatic action in general, the second contains an account of some of the more important diastases. The classification of these substances is first of all made according to their action. The main groups are diastases of—(*a*) coagulation and decoagulation; (*b*) hydration and dehydration; (*c*) oxidation and reduction—here the process of oxidation under aërobic conditions, where the oxygen is obtained from the air, is distinguished from that under anærobic conditions, where the oxygen used is in a combined state; (*d*) decomposition and recomposition. In connection with this last subject, the reversal of the diastatic process, *e.g.* the reconstruction of an ether from its alcohol and acid, is of special importance. It is pointed out that diastatic action is not something *sui generis*, but can be reproduced by non-diastatic substances—alkalies, acids, etc.; the difference is not so much one of quality as of quantity. Further classification of the diastases is based upon the substances on which they act, and upon their resulting products. The origin of diastases, the part played by secretions containing them, and the conditions influencing their formation, are also considered. Subsequent chapters contain the various modes of preparing diastases, the general laws of their action, the influence of heat, electricity, etc., upon them, conditions paralysing and accelerating their action, etc. Much of this is necessarily of a highly technical character, but is expounded with great clearness. A chapter here is devoted to toxines, venins, and antitoxines. The subject is dealt with somewhat briefly, and chiefly in relation to the action of heat on these bodies. It is pointed out that in this respect they are closely analogous to diastases—for both classes there is not a definite fatal temperature, but a curve of fatal temperature depending upon the degree of heat applied and the time of exposure, this curve also varying with the nature of the surrounding medium, its acid or alkaline character, etc. The author, however, does not state definitely that toxines are really diastases.

The second part of the volume, as already stated, is devoted to the individual diastases, amylase, sucrase, maltose, etc., each being described in detail; special chapters are also given to agglutinines and lysines. Agglutinines are regarded as belonging to the class of coagulative diastases, this conclusion being chiefly based on the work of Kraus and Nicolle, who have shown that an agglutinating serum has an action resembling coagulation on filtered cultures of the corresponding bacterium, and that when minute particles of any kind are added to the filtrate they are involved in the coagulum and thus agglomerated. These results are undoubtedly of importance, but we much doubt whether the rapid agglutination of bacteria taken from a culture and distributed, say, in water or salt solution, can be due to coagulation of some material produced by the bacteria and present in solution. Lysogenic action is properly described as depending on two substances, one present in normal serum—a diastase, lysine—and the other non-diastatic, specially formed or formed in excess. The source of lysines is considered to be the leucocytes. Duclaux combats the idea of specific action, substituting for it superiority of action. This is no doubt correct, but we fail to find an explanation of this superiority, though it is practically implied that by displacing the idea of specificity the difficulty of explanation is removed. The important work of Ehrlich on this subject is too recent to be included in the text, but is in agreement with Duclaux's belief that the "immune-body" is not a ferment.

In this review we have been able to sketch only some of the chief features of a work of the highest utility and importance. And abounding, as it does, with detailed accounts of the observations of the author and of others, it cannot fail at the same time to impress the reader by the comprehensive grasp of the subject presented, and by the endeavour manifested throughout to arrive at fundamental principles in ferment action. We may add that a useful and well-selected bibliography is appended to each chapter.

ROBERT MUIR.

Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M.D., Ph.D., LL.D. London: The Rebman Publishing Co. 1898.

WITH the ever-increasing knowledge of medicine, it becomes more and more difficult to write a text-book for general use, which presents its readers with all the necessary information in a reasonable amount of space. Dr. Anders has, however, overcome these initial difficulties, and has succeeded in producing a work which will prove useful both to students and practitioners.

In a book of this description one naturally finds the generally accepted principles adopted for the most part, and therefore controversial criticism is not to any great extent called for. There are, however, here and there statements which might prove misleading if taken too literally. For instance, most physicians will certainly not agree with the author in his statement (p. 187) that "the prognosis in all cases of post-diphtheritic paralysis is very favourable." And again (p. 188) will be found the statement that "the cases of neuritis invariably recover." Such a hopeful prognosis is not, unfortunately, always justified, and to assume that every case is going to get well may easily lead to serious error. There are other points of interest here and there which might likewise be fairly subjected to criticism, but many of them are, after all, but differences of opinion rather than fact.

The accounts of the different diseases are clearly given, and leave a vivid picture in the mind of the reader, while their pathological and bacteriological aspects are well up to date.

One of the features of the book is the large number of tables that are employed in comparing the symptoms of different diseases, a useful method, and one which is always well received by students. There are numerous illustrations, some of which are coloured.

H. CAMPBELL THOMSON.

Transactions of the American Pediatric Society. Volume x. Philadelphia. 1898.

THE tenth volume of these *Transactions* contains a large number of interesting contributions, only a few of which, however, it is possible to notice. Although the papers are of somewhat unequal merit, the volume as a whole maintains the high standard which has characterised the American Pediatric Society's *Transactions* in the past. A very considerable space is devoted to the record of the Society's collective investigation on infantile scurvy, and the information contained in this report may be recommended for careful perusal to all who are interested in the subject. It is a matter for regret that the conclusions arrived at are so meagre, considering the vast amount of material at the disposal of the committee, from which to draw their deductions. The result may be practically summed up in the statement that the further a food is removed in character from the natural food of a child, the more likely is its use to be followed by a development of scurvy. Considerable difference of opinion seems to have prevailed as to whether sterilisation of milk was or was not sometimes responsible for the production of the disease. Jacobi relates three cases of amaurotic family idiocy. In all of these there were the same symmetrical changes in the macula lutea, namely, the white somewhat spherical spot, with brownish red centre, and gradual atrophy of the papillæ, the same lack of innervation, as shown by weakness of intellect and of muscular power, and the same slow but sure increase of all the symptoms. In discussing the pathological changes found in these peculiar cases, he combats Sach's idea that they are due to a mere arrest of development in early embryonic life, and states his opinion that the degeneration is an acquired one, owing its origin to some toxic condition. Dr. Holt writes in his usual clear and convincing style, on the scope and limitations of children's hospitals. Doubtless, could the Utopian ideas he formulates be carried out, we would have ideal hospitals, but the staff of nurses employed would be so enormous, and the pecuniary outlay so prodigious, as to make his scheme quite impracticable. The space at our disposal precludes the mention of many other articles of more than average merit, but their perusal clearly proves, if such proof were required, that the American physicians still easily lead the way in this special department of medicine.

G. H. Melville Dunlop.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICINE.

UNDER THE CHARGE OF

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Aphasia Sensorielle.

Within the space of twelve months, from August 1898 to August 1899, Touche was able to observe clinically and post-mortem nine cases of interference with language-powers; four with active sensory aphasia, two cured cases of the same, and three with mixed motor and sensory aphasic symptoms (*Arch. gén. de méd.*, Paris, 1899, tome ii. No. 6).

Case 1.—R., a male, æt. 52; dyspnœic, yellow complexion, dropsy of the legs; small and irregular pulse—in fact, in a grave state of asystole. His voluntary speech was a combination of paraphrase and nonsense; in repetition of words spoken, and in reading, the words were entirely misconceived. He managed to write his name badly but correctly; then, when asked to write any word he chose, traced an anagram of it devoid of meaning. Writing to dictation and from a copy were equally poor. R. was quite sensible of his mistakes, and angered thereat. He understood what was said to him, and recognised objects, which he was able to indicate by words with some small resemblance to the actual names. Death from cardiac failure ensued. Post-mortem, on removal of the skull and meninges, the convolutions about the centre of the left parietal lobe were easily depressed by light palpation. Section showed softening in the centre of the left hemisphere, up to lenticular nucleus and in the corpus callosum. A band of softening, 1 cm. broad, was traced on the surface of this hemisphere, occupying the inferior part of the anterior portion of the first parietal, and the posterior portion of the lower three-fourths of the ascending parietal convolution up to the point of the parietal operculum. The convolutions of the insula in the fissure of Sylvius were also softened. Further investigation showed this to be but an offset from a large area of softening which had invaded the external capsule and lenticular nucleus further back, reaching to internal capsule.

Case 2.—B., male, æt. 66; left-handed, but wrote with right hand. Only symptoms were those of speech. His voluntary speech was a pure example of periphrasis; the words spoken were correct, but were not appropriate to the idea he wished to express; this was most marked under fatigue. He repeated spoken words perfectly, sang well, but could not recite from memory. He read aloud fairly well. Voluntary, copied, and dictated writing was profoundly altered. Mathematically he could recognise single figures, but in writing out large numbers his errors were many—46,287 for 162,487, for example;—he could add up two small numbers, of one or two figures—18 + 6, 16 + 14; above those became quite confused; subtraction was similar; multiplication was more difficult, the factors being the more constantly transposed the higher they rose. The power of division was lost. Word-deafness was absent, or only very slight.

Autopsy showed the left hemisphere of the brain to be perfectly healthy. On the right side there was an area of softening, destroying the whole of the "pli courbe."

Case 3.—M., æt. 63, in August 1898 presented absolute word-deafness (cf. *idem*, July 1899). The brain after death showed obliteration of the left posterior cerebral artery, softening of the cuneus, the lingual and fusiform lobules, the hippocampus, and the third temporal convolution.

Case 4.—De L., æt. 65, with right hemiplegia, died from tuberculosis. Absolute word-deafness. The lesions present comprised an old hæmorrhage of the external capsule, and a small area of softened tissue of the posterior half of the second temporal convolution, just behind the supramarginal gyrus. The lesions and symptoms of the other five cases may be summarised as follows:—

Lesion.	Symptoms.
Case 5.—Softening of first temporal convolution and of the gyrus supramarginalis.	No word-deafness.
Case 6.—Lesion of the lowest portion of the ascending and of the second parietal convolution and of the gyrus supramarginalis.	No word-deafness.
Cases 7, 8, and 9.—Lesions of both motor and sensory centres.	Absolute word-deafness in 7 and 9; almost complete in 8.

Migraine and Epilepsy.

Spiller (*Am. Journ. Med. Sc.*, Phila., January 1900) gives details of two cases bearing upon the connection between migraine and epilepsy. The first, a male, æt. 51, had used alcohol since his eighth year, and smoked to great excess. When 44 he began to suffer, for a minute or two, from attacks of numbness of the right side of the tongue and inability to speak, occurring only once or twice a year at first, but becoming more frequent later. When 48 he began to have similar attacks of numbness in the right arm and leg, with impaired function. He did not lose consciousness during the attacks, which were looked on as *petit mal*. *Grand mal* followed in course of time, but without convulsions. No word-blindness, agraphia, or word-deafness could be detected. The absence of headache, and of scintillating scotoma, made a diagnosis of migraine doubtful. Spiller regards the case as one of sensory epilepsy.

CASE 2.—A well-developed woman, æt. 21, suffered from unilateral headache, transitory paresis, and paræsthesia on the opposite side of the body, and paraphasia, more akin to migraine, and dated from a severe fall on the head in childhood (when four and a half years old). Her mother suffered from peculiar attacks of headache. One recent attack, about seventeen years after the commencement of the symptoms, simulated true epilepsy.

After discussing the literature of sensory epilepsy and migraine, Spiller comes to the following conclusions:—(1) "Attacks of migraine occur associated with nausea and vomiting; this form is known as simple migraine, and usually remains unaltered during the life of the patient. (2) In other cases, visual disturbances (hemianopsia, scintillating scotoma, amaurosis, etc.) are associated with the migraine, and the disease is then known as ophthalmic migraine. (3) When paralysis of the ocular muscles occurs with the migraine, the disease is described as ophthalmoplegic migraine. (4) Migraine, especially the ophthalmic form, is related to epilepsy, and the attacks of migraine may precede for many years the convulsive attacks of epilepsy, although in most cases of migraine no convulsions are ever detected. (5) In some cases epilepsy appears in the form of one or more of the disturbances seen occasionally with migraine, and later, even after many years, convulsions develop. The disease may be epilepsy from the beginning. It matters little, with our uncertain knowledge of the pathology of the two diseases, whether we regard these as abortive cases (*formes frustes*) of migraine, that later become associated with epilepsy, or as abortive forms of epilepsy (sensory epilepsy) in which the convulsions later become apparent, provided we recognise a relation between some forms of migraine and epilepsy."

SURGERY.

UNDER THE CHARGE OF

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ABORTIVE AND PROPHYLACTIC TREATMENT OF GONORRHŒA.

DR. JAMIN, in reviewing the recent work by Guiard on this subject, refers to the method of irrigation with permanganate of potash associated with the name of Janet; it is pointed out that the method is not always abortive, seeing that it may not cure a gonorrhœa even over a period of weeks, and that too much has been expected of it. Guiard never employs a stronger solution than 1 in 6000 to 1 in 10,000; he prefers a syringe to an elevated reservoir of lotion, as capable of being more gently and more intelligently manipulated. The abortive action is only secured if the treatment be instituted on the first, second, or, at the latest, the third day of the disease. After the third day the method is probably inferior to others, and should not therefore be practised. Guiard's method of permanganate irrigation is carried out with the patient recumbent, and his urethra cocainised; during the first three or four days the irrigation is carried out every twelve hours; subsequently once daily will suffice. The entire urethra is irrigated, both anterior and posterior, and the lotion is allowed to enter the bladder. In the majority of cases, one ceases to be able to find gonococci in the discharge after two or three irrigations; if they are still found after five or six days, it may be assumed that the method has failed, and it is then just as well to abandon it.

Motz of Paris employs a more vigorous abortive treatment. The first irrigation is confined to the anterior urethra (segment by segment), and the solution employed is the permanganate 1 to 500; twelve hours later this is repeated with a weaker solution (1 to 1000), and is followed by lavage of the posterior urethra with a solution of 1 to 2000. If the secretion diminishes and becomes more liquid, the anterior urethra is irrigated twice daily with the 1 to 2000 solution, the posterior is irrigated once daily. If the discharge does not diminish, he employs a 1 to 1000 solution, three or even four times in the twenty-four hours. Noguès of Paris corroborated Motz's views as to the importance of irrigating the posterior urethra, and as to the necessity of restricting the abortive treatment to cases coming under observation during the first day or two of the disease. The irrigation of the posterior urethra is carried out by means of a syringe which is sufficiently capacious and powerful to overcome the resistance of the constrictor urethra, which may be weakened with advantage by a previous instillation of cocain. The use of a catheter for irrigating purposes is condemned.—*Ann. d. mal. d. org. génito-urin.*, Paris, Nov. 1899.

"ESSENTIAL HÆMATURIA."

THIS subject was given precedence at the recent meeting of the Association Française d'Urologie, and was reported upon by Malherbe of Nancy and Legueu of Paris. By essential is meant any hæmaturia which appears independently of any known lesion of the urinary organs, such as injury, cancer, stone, tuberculosis. Confining their observations to cases submitted to anatomical as well as clinical observation, the reporters find that a positive lesion was found in nearly all the cases, *e.g. calcareous incrustations* of one of the pyramids, *early tuberculosis;* the great majority were cases of *chronic nephritis* in which exacerbations of congestion sufficed to bring about hæmorrhage; this chronic nephritis is usually unilateral; the amount of urine secreted is normal; there is merely a trace of albumin, and the cardinal symptoms of Bright's disease are absent. If legitimate, the term "hæmaturic nephritis" might be employed to describe the condition. Other essential hæmaturias have been identified with *floating kidney;* the hæmorrhage disappears when the kidney is fixed by operation. The *hæmaturia of pregnancy*, described by Guyon, may be to a certain degree a physiological congestion, or it may be also the result of an interstitial inflammation. Cases of essential hæmaturia ascribed to *hæmophilia* and to *angio-neuroses* have been recorded, but are to be accepted with reserve. The authors report that there are only two cases of essential hæmaturia in which a histological examination of the kidney has yielded negative results; they are inclined, therefore, to speak of the condition as pseudo-essential hæmaturia. It may be so slight as to be of little importance, or it may be sufficiently abundant to endanger life. Medical treatment is of no avail in the latter. *Surgical treatment* is therefore indicated. Nephrectomy is the most radical measure, and is successful if the other kidney is healthy, but is only to be practised in the existence of new growths or tuberculosis. In floating kidney, nephropexy is the procedure of choice. Nephrotomy is curative in the majority of cases when the hæmorrhage is the result of chronic interstitial nephritis. In view of the difficulty of distinguishing clinically the different conditions etiologically associated with hæmaturia, the authors make the following propositions:—When a renal hæmaturia resists ordinary therapeutic measures, an exploratory incision should be made; the kidney is exposed; if mobile it is to be fixed *in situ;* otherwise it should be incised and examined; if there is no disease necessitating removal of the organ, nothing further is done, and recovery may be confidently anticipated. Should the hæmaturia recur, nephrectomy may be practised at a subsequent period.—*Ann. d. mal. d. org. génito-urin.*, Paris, Nov. 1899.

OPERATION FOR CONGENITAL ABSENCE OF LOWER TWO-THIRDS OF TIBIA.

M. NORÉ-JOSSERAND of Lyons records the case of a child in which the lower two-thirds of the tibia were absent; the fibula was present, but the foot was so deformed that standing and walking were quite impossible. The first operation consisted in freshening the lower end of the portion of tibia, dividing the fibula at the same level, and in inserting the latter into the former. At the second operation the deformed astragalus was removed, the foot was forced into proper position, after division of the plantar fascia; a socket was made in the upper surface of the os calcis, and into the socket was inserted the freshened lower end of the fibula. The result was very satisfactory; a skiagraph showed that union had taken place between the tibia and fibula, that the displaced portion of the latter bone had increased considerably in size; in spite of the shortening, the child walks very well with the aid of a thick sole to its boot. M. Siraud, who had originally presented the child to the Surgical Society of Lyons, recalled the condition of affairs before operation: at the knee the lower end and condyles of the femur were very poorly developed, and were ill fitted to the facets of the tibia; the upper end of the fibula was displaced upwards and articulated with the femur. His own view had been that no satisfactory result could be obtained without an artificial ankylosis at the knee. He confessed, however, that the results of the operation were not only remarkable as regards the condition of the leg and foot, but that the tibio-femoral joint had so developed in consequence of the altered functional condition of the limb, that it had become strong and rigid.—*Rev. de chir.*, Paris, December 1899.

LUMBAR PUNCTURE FOR PARAPLEGIA FOLLOWING INJURY OF THE LUMBAR SPINE.

M. **Albertin** presented to the Surgical Society of Lyons a man, æt. 26, who had fallen from a height of 30 ft., landing first on his feet and then on his back. There was bruising in the lumbar region, but no evidence of fracture of the spine. There was partial paraplegia of the lower limbs, chiefly affecting the extensor muscles. As there was no improvement after a fortnight, Albertin made a median incision at the lumbo-sacral junction, and pushed a large trocar and cannula into the spinal canal. There escaped about 30 to 35 c.c. of a sero-sanguineous fluid, resembling prune juice or the contents of an old-standing hæmatoma. The wound was closed. Two days later the motor and sensory paralysis showed decided improvement, and on the seventh day the patient was able to raise the heels off the bed. On the twentieth day he was exhibited to the Society, and although there were still traces of the paraplegia, he was able to walk. Albertin ascribed the paralysis to compression of the cauda equina by extravasated blood.—*Rev. de chir.*, Paris, Dec. 1899.

INGUINO-SCROTAL "LYMPHANGIOMA" IN FILARIAL DISEASE.

Professor Braut Paes Leme of Rio de Janeiro records the case of a man, æt. 23, who applied at the hospital for operative treatment of a hernia. There was a tumour as large as a fist in the left inguino-scrotal region, which disappeared on lying down, and reappeared as soon as he resumed the erect posture. He had tried a truss, but found it unsatisfactory. The tumour is soft and dull, like a lipoma; there is no gurgle on reduction. The testicle and cord, the inguinal and femoral glands, and the skin, are normal. At the operation the anterior wall of the inguinal canal was divided; the tumour presented a lobulated surface like a lipoma; it extended into the inguinal canal, and was not adherent to the cord; a long pedicle was drawn out of the abdomen through the inguinal canal, and securely ligatured; the tumour having been removed, the canal was closed by Bassini's method. In spite of an abundant ooze of serous fluid, noted during the operation, the wound healed by first intention. The fluid which oozed from the wound was not examined, but the same evening filariæ were looked for in the blood and found to be present. The tumour, on examination, was found to be composed almost exclusively of lymphatic vessels, their walls and valves being greatly thickened; no filariæ were found in their interior. The author regards the condition as one of lymphangioma, on account of the hypertrophy of the walls of the lymphatics; but it would appear more accurate to describe it as one of filarial lymphangiectasis.—*Rev. de chir.*, Paris, Dec. 1899.

THE FORMATION OF GANGLIA IN THE SUBSTANCE OF TENDONS.

Considerable interest attaches to the investigation of cases of ganglion, from the point of view of their etiology. The old view that they originated from the hernial protrusion of the synovial membrane of tendon sheaths and of joints, has been severely criticised in recent years, and especially by Ledderhose. Operative experience has shown that although ganglia are more common in the vicinity of tendons and of joints, that there is rarely any connection between them, and that the wall of a ganglionic cyst is more intimately fused with the surrounding tissues than would be possible in the case of a herniated pouch of synovial membrane. Ganglia have also been met with, which were not made up of a unilocular cyst, but which were composed of newly formed fibrous tissue, permeated with areas of a jelly-like material, derived from the former by mucoid degeneration. Finally, a case was recorded by Thom in which a ganglionic cyst was situated in the substance of one of the extensor tendons of the fingers, replacing the proper tissue of the tendons to the extent of 1 cm. Hofmann of Bonn now publishes a similar case (in a girl, æt. 17), in which a ganglion as large as a plum had formed in the continuity of the tendon of the peroneus tertius, midway between the external malleolus and the base of the fifth metatarsal bone. It was ascribed to an antecedent injury; the only complaint made was that it prevented the patient wearing a boot. The anterior and lateral walls of the cyst were removed; the edges of the posterior wall were folded backwards and stitched to each other, so as to reproduce the original tendon. Hofmann regards this observation as confirming the view maintained by Ledderhose and others, that ganglia are to be regarded as new formations, of the type of cystomata.—*Centralbl. f. Chir.*, Leipzig, Dec. 16, 1899.

TRAUMATIC KYPHOSIS—"SPONDYLITIS TRAUMATICA."

KÜMMELL of Hamburg was the first to draw attention to a characteristic deformity of the vertebral column which developed some considerable time after an injury to the spine. The latter is usually some heavy object falling on the head, neck, or back, or sudden over-extension of the spine. At the same time the injury is not one which would be generally regarded as severe enough to cause fracture. The individual is confined to bed for one or more weeks, complaining of tenderness over the spine, and it may be also of cord symptoms; when these disappear he is able to get up and return to his work. After a variable interval—it may be so long afterwards that he has almost forgotten the original injury—there develops a kyphosis or angular curvature, with or without pain and other symptoms. Schulz, also of Hamburg, read a paper on the subject at the recent Congress of German naturalists and doctors at Munich, in which he reviewed the various theories which had been propounded to explain the origin of the kyphosis. The original view maintained by Kümmell was that, although some of the cases were really examples of incomplete fracture of the spine, others were the result of a rarefying inflammatory process in the bodies of the vertebræ. Mikulicz suggested a tropho-neurosis, the result of injury to the intervertebral ganglia and nerve roots. Others regarded the condition as allied to osteomalacia. Schulz expresses what appears to be the more reasonable view, that the essential cause of the kyphosis is a compression or other incomplete fracture of the spine, in which the callus formed is not only deficient in stability, but is subjected to strain and pressure before it is matured. In this he was supported by Oberst, Kümmell, and Schede.—*Centralbl. f. Chir.*, Leipzig, Dec. 16, 1899.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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A CASE OF AXIAL ROTATION OF THE UTERUS BY A LEFT-SIDED OVARIAN CYST.

WINTER (*Centralbl. f. Gynäk.*, Leipzig, 1899, No. 39) states that about forty cases of this condition have now been collected. His patient was 44, never pregnant, regular menstruation, complained of abdominal swelling (gradual), with bladder symptoms of two years' duration. On examination, there was found an elastic, tense cyst extending upwards to midway between the umbilicus and sternum, and regarded as right-sided. Sound passed 1½ cms. At the operation, cyst was found thick walled (1½ cms.), and contained two litres of chocolate-coloured fluid. There were dense adhesions to intestine, cæcum, and appendix. The multilocular ovarian cyst was found to have a pedicle 4–5 cms. long, evidently connected with the left side. The uterus was twisted from right to left, and the right ovary, being slightly cystic, was also removed. Death from shock twelve hours after operation.

Winter believes that the cyst, originally left-sided, grew first backwards towards the pouch of Douglas, and from this extended to the right side behind the uterus, becoming firmly adherent to the cæcum and vermiform appendix. As a consequence, there was traction on the left side of the uterus, which became rotated on its axis, the left side being directed backwards, the right side looking forwards and behind the small right-sided ovarian cyst. The cervix was not involved in the rotation, which was limited to the supravaginal part of the uterus as far as junction of leux and body.

PRIMARY TUBERCULOSIS OF THE VULVA IN AN ADULT, AND ITS RELATION TO ULCUS RODENS VULVÆ.

A. RIECK relates a case of a woman without hereditary taint, whose husband had died of phthisis, who was the subject of a slowly advancing ulcer of the vulva, with elephantiasis of one of the labia minora. It was doubtful whether the bacilli found in the discharge from the ulcerated surface were tubercle or smegma bacilli. After prolonged but unsuccessful treatment, the ulcer was removed by operation, and on examination of the tubercles, giant cells, caseation, and tubercle bacilli were demonstrated. Tubercular changes in the vulva have seldom been reported, and the author concludes that the cases of ulceration of the vulva with elephantiasis reported by Beit are due to tuberculosis.—*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. ix. Heft i.

Infection of an Ovarian Cyst by the Typhoid Bacillus.

Three cases of such an infection are already published, to which Waigren furnishes a fourth. The patient, æt. 39, who had an attack of typhoid fever lasting six weeks, complained of a tumour in the hypogastrium which she had been conscious of for a long time, but which became painful during her illness. She had rigors and fever in the evening, and suffered from sleeplessness and want of appetite. The tumour was diagnosed as an ovarian cyst, and removed by laparotomy. It was found to be a dermoid cyst containing a considerable quantity of greenish yellow, bad smelling fluid, with brighter flakes and lumps and some hairs. Cultivations from this fluid revealed bacilli identical with the *Bacillus typhosus* of Eberth Gaffky.—*Arch. f. Gynäk.*, Berlin, Bd. lix. Heft i.

Floating Kidney Simulating Diseases of the Genital Organs in Women.

A. Lapthorn Smith has met with a large number of cases in which a displaced kidney produced all the symptoms of diseases of the genital organs, while the latter were quite healthy, or in which well-defined diseases of the uterus and appendages co-existed with displaced kidney, so that the patient continued to suffer as much as ever after the thorough removal or repair of the affected genital organs. The condition occurs much more frequently in women, and is usually on the right side, and is caused by—(1) Anything which causes a sudden and marked loss of fat in the perirenal cellular tissue; (2) frequent pregnancies, which cause relaxation of the abdominal wall and lessening of the intra-abdominal pressure; and (3) making great efforts in lifting, or sudden falls, dislocating the kidney. The symptoms are largely due to the close relation of the kidney to the sympathetic system in the abdomen, and are caused by the dragging on the nerves by the displaced kidney when the patient assumes the erect posture, and are as follows:—(1) Disorders of digestion accompanied by pain which may be described as cardialgia or gastrodynia with anorexia, gaseous eructations, foul breath, and constipation. These symptoms are ameliorated if, for any cause, the patient has to lie in bed for some time, but return when she again resumes the erect posture. (2) General nervousness. Naturally sweet-tempered women become cross and irritable. They cannot sleep well on their left side, and do not sleep well even on their back or right side. When sitting or standing they cannot remain still, but are in a constant state of fidgets. This nervousness, like that due to a lacerated cervix, does not disappear immediately on the cause being removed, the nervous system seeming to acquire a disordered habit. (3) Palpitation of the heart, coupled with pain over the cardiac end of the stomach, lead the patient to think she has heart disease. When we remember that the solar plexus is formed by the sympathetic nerve and the termination of the right pneumogastric, and supplies all the abdominal viscera, that these two nerves supply the heart, while the sympathetic controls the circulation in the brain, it is easily understood how a floating kidney dragging on the solar plexus should give rise to these symptoms. Lastly, there are symptoms directly due to the kidney displacement, such as pain in the back, partly due to the dragging and partly to the intermittent hydronephrosis caused by the kinking and consequent blocking of the ureter. In these cases the patient passes very little water during the day, and the pain increases steadily until she goes to bed, when, a few minutes after emptying the bladder, she requires to get up and passes a large quantity of urine, experiencing great relief. While emaciation is more a cause than a symptom, it is almost always present, and should lead to the suspicion that floating kidney may be present.

If the condition is suspected, the diagnosis is easy if the kidney be freely movable, but more difficult when it has only moved two or three inches from its proper place. The diagnosis is easier if the patient is examined while standing and leaning forward with her hands on a chair, thus releasing the abdominal muscles. Should difficulty be experienced, an anæsthetic should be administered.

Treatment.—Rest in bed with dietetic treatment has in some cases cured the condition, but as most sufferers wish a more rapid cure, other means must be adopted. Mechanical support by means of corsets or pads gives relief in some cases, but if the kidney be below the waist line it is pushed down and is prevented from going up again. Where these methods are impracticable or unsuccessful, the operation of nephrorrhaphy is required. In this operation care should be taken to incise the kidney capsule for its whole length and strip it to the width of half an inch, so as to insure a long and wide line of adhesions. Silkworm gut sutures should be employed, and not catgut or kangaroo tendon as used by some operators, as the latter tend to be absorbed before the adhesions are sufficiently firm to support the kidney.—*Journ. Am. Med. Assoc.*, Chicago, Nov. 1899.

THERAPEUTICS.

UNDER THE CHARGE OF

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Medical Treatment of Hæmorrhoids.

Boas says that by far the most common cause of piles is the pressure of hardened fæces in the rectum or sigmoid flexure. Tumours of the rectum and pelvis, pregnancy, and hindrance to the portal circulation higher up, are also causes, but not so amenable to treatment. Cases also occur without any visible cause. To obviate constipation is the most pressing indication, by giving a diet which increases peristalsis, such as acid fruits, sugar, oatmeal, brown-bread, vegetables, etc., and by avoiding milk and other bland articles. Tea, coffee, and a moderate amount of alcohol do no harm, but frequent bleeding indicates abstinence from alcohol, pepper, mustard, and other irritants. Exercise should be attended to. The anus should be washed or douched after defæcation with water or weak alum or tannin lotions. If purgatives are necessary, preparations of rhubarb, sulphur, magnesia, tamarinds, or cascara sagrada do best, and the smallest effective dose should be given. Without continued treatment of this kind, the use of suppositories and ointments has a very transient effect, but they are useful to heal excoriations and stop slight bleeding. Morphine, belladonna, cocaine, iodoform, iodine, etc., all act well in suppository. In bleeding, the preparations of witch hazel should be given for about three months daily, and also used as a suppository. If the hæmorrhage be very severe, it can be stopped by packing the rectum. If strangulation occur, no forced attempt should be made to replace the mass inside the rectum. A suppository of cocaine and morphine should be placed in the rectum, and after careful inunction, very gentle attempts at reposition may be made. Leeches may be used for depletion. If this is unsuccessful the piles must be removed.

ATROPINE IN ASTHMA.

RIEGEL states that for many years he has used atropine subcutaneously to cut short attacks of asthma (*Deutsche med. Wchnschr.*, Berlin, 1899). He gives $\frac{1}{120}$ to $\frac{1}{60}$ gr., and attributes its action to a paralysing effect on the terminations of the vagus nerve which supply the bronchial muscles. It does not act well in all cases, and this he attributes to differences in etiology.

TOLERANCE TO ARSENIC.

BESREDKA has continued his researches on this subject (*Ann. de l'Inst. Pasteur*, Paris, June 1899). In rabbits, he found that the repeated administration of gradually increased small doses of sodium arsenite produced a certain degree of immunity only in a very few animals, as most of those so treated tended to emaciate and die. Those which survived became able to tolerate the minimum lethal dose. If to a normal rabbit the lethal dose be given at once the phagocytes are killed off and death ensues, but if administered in four equal portions during twenty-four hours, it is well borne, and for the next four or five days there is very marked leucocytosis, the leucocytes are capable of absorbing the arsenic and there is no sign of illness. Another method which he found successful was to give one-fifth lethal dose, and then fifteen or twenty-four hours after, the lethal dose. The hyperleucocytosis produced by the first injection, enables the white corpuscles to deal satisfactorily with the second. Arsenic becomes heaped up in the liver cells, which, therefore, must become immune to its action. The immunisation is always slight compared with what can be induced in the case of toxins or snake poison, but six or eight days afterwards the serum of a rabbit so treated is antitoxic to arsenic. Eight c.c. of it suffices to protect a healthy rabbit against the lethal dose of arsenic, whether given at the same time or twenty-four hours previously. The arsenic and its antitoxin may be mixed together, or injected at different points subcutaneously. The antiarsenin does not contain arsenic. It probably acts by greatly increasing the number of polynuclear leucocytes, and thus enables them to absorb and deal with what would otherwise be a lethal dose of arsenic. It has no chemical action on solutions of arsenic in vitro.

BLOOD CHANGES IN HIGH ALTITUDES.

IT has been found by many observers that the number of red corpuscles increases greatly and the hæmoglobin less markedly in man and animals living at high altitudes. Schaumann and Rosenquist (*Wien. klin. Wchnschr.*, 1899), by keeping animals under glass-jars from which the air was partially exhausted, have shown that these results follow rarefaction of the atmosphere. On the animals resuming existence under ordinary conditions, the number of corpuscles soon diminished again, but remained about 20 per cent. higher than before the beginning of the experiment. During the increase the average size of the red discs increased, and the microcytes diminished in number, while nucleated corpuscles were found frequently. Hence there is a more active formation. During blood regeneration after anæmia they found that it was chiefly large forms which made up the increase, not microcytes.

CHRONIC TRIONAL POISONING.

VOGEL publishes the case of a woman, æt. 28, who, on account of sleeplessness, had taken, between January and June, 1900 grs. of trional (*Berl. klin. Wchnschr.*, 1899). She suffered very severely from cardiac feebleness, so much so as to endanger her life, and excreted in the urine a colouring substance closely allied to hæmatoporphyrin, but not identical with it. Nephritis, severe abdominal colic, and marked nervous prostration were the other chief symptoms. The treatment consisted in giving alkalies freely, and in general strengthening measures, but it was four months before the patient had recovered her strength. Gastro-intestinal irritation, feebleness, and heart weakness have been observed to follow the administration of trional, and seven other cases of chronic poisoning have been already recorded. It is, therefore, necessary to use the same precautions as with sulphonal, and to avoid giving either continuously.

EUPHTHALMIN, A NEW MYDRIATIC.

VINCI gives an account of several anæsthetising and mydriatic substances which can be formed from triacetonamin (*Therap. Monatsh.*, Berlin, Dec. 1899), one of which has been used with success in practice to dilate the pupil. The base which has been named euphthalmin, is insoluble in water, but its hydrochloride ($C_{17}H_{25}NO_3HCl$) is quite soluble and convenient for use. He states that a 2 to 5 per cent. solution gives a dilatation, which, along with the disturbances of accommodation, passes off in one to two hours. It has no action on intraocular pressure, and causes no local irritation nor symptoms of systemic poisoning. The solution can be sterilised by boiling, and keeps for a long time without decomposition.

In animals it was found to first excite and then paralyse the central nervous system. It paralyses the terminations of the vagus, and of the chorda tympani, just as atropine does, but there is a marked fall of blood pressure owing to extreme dilatation of the arterioles. It has a paralysing effect on all peripheral nerves. Mydriasis begins in fifteen to twenty-five minutes after a few drops of a 2 to 10 per cent. solution, reaches its maximum in about an hour, and subsides in three to six hours usually. It acts by paralysing the terminal fibres of the oculo-motor nerve.

Hinshelwood (*Ophth. Rev.*, London, Nov. 1899) states that two or three drops of a 5 per cent. solution will dilate the pupil fully in from twenty to thirty minutes, that the paresis of accommodation passes off in from 1½ to 2 hours, that no local irritation ensues, that there is no increase of ocular tension, and no general symptoms, and that the mydriasis disappears completely in from eight to twelve hours.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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PRECIPITATE LABOUR IN A PRIMIPARA, ÆT. 43.

KNEPPER records an interesting case of precipitate labour in the *Vrtljschr. f. gerichtl. Med.*, Berlin, 1899, Heft 4. The woman, who had been informed of the difficulties of a labour by her neighbours, consulted a doctor and a midwife as to the indications of impending labour, so that she might be prepared for the event. When proceeding to go to bed one night, her husband being present in the room, she suddenly felt what she considered to be a call to stool. While in the act of placing herself upon the chamber-pot, the child was precipitated from her into this utensil. The doctor and midwife, who arrived in the course of a few minutes, found her standing by the side of the bed holding the infant in her arms. The umbilical cord was still attached to the placenta *in utero* and to the child, being stretched by thus having to support the weight of two petticoats and a dress, which she was wearing. The child was living, and a strong, well-developed female, weighing 6½ lb., and nearly 20 in. in length; circumference of the head, 13 in. There was no caput succedaneum, nor any mark of injury upon the child, except a small superficial abrasion over the right parietal bone. There was no blood upon the floor or upon the mother's clothes, while in the chamber-pot there was only about 200 c.c. of a slightly blood-stained fluid, evidently liquor amnii. The frenulum showed a very slight tear, but otherwise the maternal parts were uninjured. Her pelvis was not unusually large. The mother and child both did well, although the former suffered afterwards from symptoms of prolapse of the anterior vaginal wall.

THE DETECTION OF ARSENIC BY BIOLOGICAL METHODS.

IN the *Berl. klin. Wchnschr.*, 1899, No. 42, Scholtz describes a method by which he detected arsenic, after internal administration of small doses, in the hair, skin, urine, and sweat. The experiments were conducted with a view to deciding whether in certain skin affections the administration of arsenic acts beneficially by indirect action upon the nervous system or directly upon the tissue of the skin. The desquamated particles of skin from two cases of psoriasis were examined, both of which recovered after subcutaneous injection of arsenious acid; in one case a total amount of 0·45 grm., and in the other 0·6 grm. was administered. With Marsh's apparatus no arsenic could be detected. Scholtz then subjected another portion of the material to the biological test, namely, by using a mould—*Penicillium brevicaule*—which, when grown on media, containing stable compounds of arsenic, gives rise to volatile arsenious gases, having a strong garlic odour, thus permitting of the recognition of the most minute traces of arsenic. The procedure consisted in taking some agar medium and adding to it a small quantity of the scales from the skin; the agar was then solidified obliquely in the test tube and inoculated with the mould. In two instances, where Marsh's apparatus had failed, a well-marked garlic odour was detected after forty-eight hours. Positive results were also obtained with small quantities of hair, urine, saliva, and sweat, and the author estimates that $\frac{1}{300}$–$\frac{1}{500}$ of a mgrm. of arsenic can be detected by this method. Gosio, Abba, and Abel have each written upon this subject, and the first named has the credit of first adopting this characteristic of certain moulds in the detection of minute quantities of arsenic.

THE MEASUREMENT OF RED BLOOD CORPUSCLES: AN ATTEMPT TO DISTINGUISH HUMAN BLOOD FROM THAT OF OTHER ANIMALS.

IN a paper (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1899, Heft 4) dealing with the above subject, Däubler gives the results of careful measurements of the fresh red corpuscles of man and some of the domestic animals—dogs, rabbits, and guinea-pigs. He measured not less than 300 corpuscles in each estimation. In the cases of three men he found the average size in each instance to be respectively, 8·0 μ–8·1 μ, 8·2 $\mu \pm 0·1\ \mu$, or a mean of 8·1 $\mu \pm 0·1\ \mu$; while in a girl, æt. 12, the average was 7·8 $\mu \pm 0·1\ \mu$. In three dogs the average of 300 measurements was 7·9 $\mu \pm 0·1\ \mu$ in two instances, and 8·0 $\mu \pm 0·1\ \mu$ in the third. In rabbits the mean of three sets of measurements was 7·68 ± 1·0, and in guinea-pigs, 7·75 $\mu \pm 0·1\ \mu$.

The difference between human corpuscles and those of the dog is small, but it is more marked in the case of both rabbits and guinea-pigs. Däubler thinks, however, that the differences are too small to constitute a means of distinguishing between the blood of man and these animals. The measurements usually accepted are:—Man, 7·7 μ; dog, 7·0 μ; rabbit, 6·5 μ; so that Däubler's differ from them slightly, and are probably more accurate. He found that the red corpuscles of the African negro had an average size of 9 μ, so that they appear to be greater than those of white races. A point of some interest which his investigation determined is that the amount of shrinking which takes place in the corpuscles of dried blood from man, dogs, rabbits, and guinea-pigs is the same, namely, 0·288 μ, and that this figure may be looked upon as constant. He further attempted to differentiate by measurement the corpuscles obtained from small dry clots, which had been treated with some of the usual softening media, *e.g.* water, glycerine, 30 per cent. caustic potash, etc., but the results were unsatisfactory. The general conclusion come to was, that any attempt to distinguish positively between the blood of man and other animals, by means of measurement of the size of the corpuscles, is to be deprecated in medico-legal cases.

A Case of Prussic Acid Poisoning.

In some medico-legal notes Baker gives an account of a case of prussic acid poisoning, in which the post-mortem examination was made one hour after death, and hence the record of the appearances presented is valuable. The woman, after drinking the contents of the phial, made one exclamation, and almost instantly fell to the floor, and became unconscious at once. She had very severe tetanic convulsions, her face became dusky, and she died in about twelve minutes, notwithstanding that medical attendance was immediately at hand and her stomach was washed out.

Post-mortem.—Face slightly cyanosed; lips, mouth, and tongue slightly eroded; pupils widely dilated; mouth and nostrils frothy. Mucous membrane of the stomach and upper part of the small intestines bright red in colour, swollen, intensely injected. Moderate engorgement of the brain, liver, kidneys, and spleen. The lungs were much engorged and œdematous, and there were numerous subpleural ecchymoses. The blood was everywhere fluid, of a cherry-red colour, and with a marked odour of prussic acid.—*Boston Med. & S. Journ.*, 1899, No. 19.

On the Normal Existence of Arsenic in the Body.

The existence of arsenic as a normal constituent of the body has been generally denied by toxicologists. Dr. Armand Gautier, however, finds, from an investigation upon this subject, that arsenic is a normal constituent of at least some organs of the body, not only in man but also in the dog, the pig, and the sheep. The organs in which he has detected its presence are the thyroid gland, the thymus, brain, and skin. In all the other organs of the body, including the blood, he was unable to detect any trace of arsenic.

In the human thyroid it is only present in very small quantity, 127 grms. taken from six bodies yielding about 1 mgrm. of arsenic. Gautier points out that his investigations establish two points of importance to toxicologists, first, that arsenic is a normal constituent of certain organs; and, secondly, that it is absent from the blood and the major proportion of the tissues and organs of the body.—*Bull. Acad. de méd.*, Paris, 1899, No. 42.

A CASE OF ACUTE LEAD POISONING.

DR. ZINN (*Berl. klin. Wchnschr.*, 1899, No. 50) records an interesting case of poisoning from a single dose of a powder consisting chiefly of lead oxide (PbO). The woman, æt. 33, rose in the night to take some bicarbonate of sodium, in order to relieve indigestion. By mistake she took a teaspoonful of "litharge of silver." The symptoms commenced six hours afterwards, and consisted of violent vomiting, pain in the abdomen, and an alternating hot and cold feeling. These symptoms continued with, however, increasing weakness of the patient until she was received into hospital nearly three weeks afterwards. There was absolute constipation. On examination at the hospital she was found to have a well-marked blue line on the gums of the upper and lower incisor teeth, and, to a lesser degree, in the gums posteriorly. The abdomen was retracted, and painful on pressure in the region of the stomach. No change could be made out in the nervous system or other organs. The urine was free from albumin and sugar. It contained a small quantity of lead. There was no lead in the fæces. After treatment for a fortnight the patient was discharged, but within a few days she was seized with hæmorrhage from the uterus, and aborted. With the commencement of the hæmorrhage the vomiting and colic, together with constipation, returned. She was again received into hospital, and, after three weeks' treatment, was dismissed cured. The blue line had disappeared, and no disturbance of any organ remained when examined two months afterwards.

Zinn remarks that the points of interest in the case are the fact that severe symptoms, lasting about ten weeks, were produced by a single dose of an insoluble lead compound, and that the acute symptoms which commenced six hours after the poison was swallowed were followed by symptoms usually met with in chronic lead intoxication. The insolubility of PbO is no obstacle to its absorption, which takes place owing to an albuminate of lead being formed in the intestinal tract. That the lead was absorbed was shown by the blue line on the gums and its presence in the urine, while its well-known slow excretion was evidenced by lead being found in the urine twenty-two days after being taken. The woman had previously aborted eight times, but the fact of the abortion occurring at the time of the lead poisoning, and being accompanied by a recurrence of the symptoms, seems to point to the lead having been the direct cause.

THE CAUSE OF DEATH FROM ELECTRIC CURRENTS.

CUNNINGHAM (*N. Y. Med. Journ.*, Oct. 21 and 28, 1899) gives the following, among various conclusions, which he has come to, from an investigation into this subject:—(1) Industrial electric currents, which traverse the whole body transversely or longitudinally in sufficient intensity, kill, because fibrillar contraction of the heart is produced, and not, as has been hitherto surmised, by producing a total paralysis of that organ, or by killing it outright. (2) Such currents neither kill the central nervous system outright nor paralyse it instantaneously. Death of the nervous system from such currents is due to the total anæmia following a sudden arrest of the circulation. (3) In rare instances, when an electric current traverses only the cerebro-cervical portion of the nervous system in considerable intensity, and for a considerable length of time, it may kill by asphyxia, consequent to a more or less complete inhibition of the respiratory movements, which occurs chiefly during the passage of the current. No existing facts warrant the conclusion that the medullary respiratory centre is paralysed or killed in such conditions. (4) It may be possible for an electric current of enormous intensity and electro-motive force to produce instantaneous death, either by its disruptive action or by producing an instantaneous heat coagulation of the cellular constituents of the body. Industrial currents do not kill instantly, although as a result of their action death rapidly occurs. The experiences of individuals who have recovered from severe electric shock indicate that such a mode of death is not a painful one.

DISEASES OF THE EAR, NOSE, AND THROAT.

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THE EFFECT OF ARTILLERY PRACTICE ON THE EARS.

At the present time this subject must prove of more than ordinary interest, so that an abstract of a recent paper by Müller of Berlin (*Arch. Otol.*, N. Y., August 1899) may be given here in some detail. Müller examined the ears of fifty-one soldiers engaged in battery practice; careful observations were made before the firing; the objective condition of the external auditory meatus and the membrana tympani was noted, while the results of certain tuning-fork tests, and the distance at which the whispered voice could be heard were also recorded. Twenty-one of the men were re-examined after exposure to the concussion of ninety rounds fired from 9-cm. bronze field-pieces, loaded with 1·6 kilo. of laminated smokeless powder; thirty were re-examined after exposure to 120 rounds fired partly from 12-cm. pieces with 1·4 kilo. smokeless powder, partly from 15-cm. nickel steel guns with a load of 4 kilo. smokeless powder. The noise produced by a salvo of six large guns is described by the writer as "tremendous, earsplitting, and unique," and he was assured by the officer in command that the report was not less powerful than that from the heaviest mortars. According to military regulations, all the privates require to wear cotton wool in their ears during firing, and for this reason rupture of the tympanic membrane is very rare. For the same reason the actual value of the following observations is diminished. In order to demonstrate the air pressure produced by the detonations, Müller relates how in one case a plug of wax, which had given no trouble before the firing, was propelled against the membrane, producing a high degree of deafness.

The observations are based upon an examination of ninety-six ears, the remaining six not affording a sufficiently satisfactory examination. Of the ninety-six ears only thirty-four could be considered as normal *before* the firing; the remainder showed alterations in the position and colouring of the tympanic membrane, such as retraction, dulness, opacities, chalky deposits, and a slight vascular injection; in no case was there any perforation. *After* the firing, the appearances were the same as before in fifty-two ears—the remaining forty-four showed distinct vascular congestion in spite of the cotton wool. The intensity of the congestion varied, being extreme in one-third of the cases, but in no instance was the whole membrane red, there being even in the most marked cases still some normal colour visible. Extravasations of blood were seen in seven men, and always in the ears which showed the greatest hyperæmia—these extravasations were multiple and very small in size. In no case was the tympanic membrane ruptured. Further interest in these observations lies in this fact, that the ears found normal before the firing were almost always normal afterwards; indeed, there were only three exceptions to this rule, a slight injection being noted in these cases. The alterations produced by the firing occurred therefore in the ears that were already abnormal, forty-one out of sixty-two being found to have increased abnormalities as the result of the concussions. The explanation is probably to be found in the fact that the detonations produce more marked results on a membrane abnormally tightened than upon one in which the tension is normal.

Turning to the tuning-fork tests which were made for the purpose of estimating injury to the auditory nerve terminations, we find that repeated violent detonations of artillery shorten the perception of bone conduction, owing to over-irritation and subsequent exhaustion of the nerve elements of the ear. As this abbreviation showed no proportional difference in the normal and abnormal ears, proof could not be led to show that the amount depended in the least upon the original appearances of the tympanic membrane. Reduction in the perceptive power of hearing also occurred, though the observations made upon this point were somewhat defective. Very few complaints of tinnitus, vertigo, or headache were made after firing, although four men complained of a roaring noise in the head. The observer was unable to note how long the alterations thus induced in the ears persisted, but judging from the fact that very few privates are invalided after two years of service, very little permanent injury would appear to follow ordinary artillery practice. In officers and some subalterns, however, who are exposed to such detonations year after year, permanent disturbances, such as partial deafness and tinnitus, are often observed. Müller is inclined to think that such results are found, in spite of cotton wool, in ears which have been to some degree abnormal before exposure. The intra labyrinthine pressure is already somewhat increased in those ears, and the dampening action of the chain of ossicles is impaired, hence such ears are more readily affected by the increase of tension following the artillery detonations. These facts have an important practical bearing upon the question of pension and the application for damages. They enable us also to draw this conclusion, that privates and others, with but slight abnormalities in the ears, may be employed for two years' service in heavy artillery, but, on the contrary, subalterns and young officers with ears at all diseased should be removed from such service; similarly workmen with slight objective alterations in the organs of hearing should be urged to avoid noisy trades or occupations.

FRACTURES OF THE HYOID BONE AND LARYNGEAL CARTILAGES.

AN interesting case of this somewhat rare accident is reported by J. E. Platt (*Med. Chron.*, Manchester, December 1899). Fractures of the hyoid bone and laryngeal cartilages are of sufficiently uncommon occurrence to make the report of any additional case of interest. The patient was a man fifty-eight years of age. From the history that was given, it seemed probable that the wheel of a cab had passed over the upper part of his neck and lower part of his face in a direction from the right to the left side. The lower jaw was fractured in two places. Although there was at first no special difficulty in respiration, it soon became greatly embarrassed, necessitating immediate tracheotomy. The patient rallied for a time, but three days later he died from broncho-pneumonia. The autopsy revealed the following interesting points:—In addition to a fracture of the body and another of the ramus of the lower jaw on the left side, the hyoid bone was found incompletely fractured at the junction of the body with the right great cornu; the thyroid cartilage showed an extensive vertical fracture starting at its lower border immediately to the right of the middle line, and running upwards slightly to the left of the pomum adami, and ending close to the upper border of the cartilage on the left of the mesial notch. Several small cracks ran for a short distance from each side of the main line of dehiscence. The mucous membrane of the larynx was greatly congested, and there was a considerable amount of extravasated blood in the submucous tissue; the extravasation also involved the epiglottis, the vocal cords and portions of the lateral walls of the larynx.

This case furnishes the writer with a suitable text for further comment upon these injuries, and, as the subject is one of more than passing interest, it will not be out of place to recapitulate here certain of the points which are detailed in the above paper. From statistics compiled by Gibb, Hamilton, and Gurlt it is seen that fracture of the hyoid bone has proved fatal in nearly 50 per cent. of recorded cases. Fractures of the laryngeal cartilages, again, show even a greater mortality, namely, 76–80 per cent. It is thus evident that fracture of the thyroid cartilage is a much more dangerous injury than fracture of the hyoid bone; further, when two of the structures are injured at the same time the prognosis becomes more grave. Fracture of the cricoid cartilage, according to statistics, whether alone or associated with a similar lesion in the hyoid bone or in one of the other cartilages, has always been fatal. In all probability, however, the prognosis is not so grave as these figures would indicate. A certain number of cases of fracture in this situation pass unrecognised during life. W. A. Lane found in one hundred bodies examined in the dissecting-room, evidence of old fractures of the hyoid bone and laryngeal cartilages in nine instances, and in no case had death resulted in any way from the injury. In one case there was a healed fracture of the cricoid. It must also be borne in mind that the mortality is too high for another reason, namely, that there are included in the statistical tables cases of suicide and homicide, so that a fallacy is thereby introduced. The point of chief practical interest which the writer insists upon, is the necessity of performing tracheotomy at once in those cases in which there is a fracture of the larynx. The onset of dyspnœa may be sudden, and if the operation be performed early, there is every reason to believe that a much larger proportion of recoveries would be recorded.

ON THE RELATION OF DISEASES OF THE ACCESSORY NASAL CAVITIES TO DISEASES OF THE EYE.

THE close anatomical relation which exists between the accessory cavities of the nose and the orbital cavities and their contents naturally tends to the production of changes in the orbit, secondary to affections of one or more of these sinuses. The necessity of duly considering the possibility of certain ocular symptoms as arising from sinus disease has been frequently exemplified, and in a recent valuable paper by Bryan of Washington (*Journ. Am. Med. Ass.*, Chicago, Nov. 11, 1899) some interesting cases are recorded bearing on this point. Secondary changes in the orbit due to frontal sinusitis may be caused by mechanical pressure, from bulging of the thin floor of the sinus, producing displacement of the eyeball, and interference with its mobility and function. Dilatation of the pupil and congestion of the papilla with a narrowing of the field of vision, especially for colours, and in very severe cases amblyopia or amaurosis are phenomena which may be induced by abscess of the frontal sinus. Pus may be discharged into the orbital cavity either through its upper and inner angle or at some point further back in its roof. Where there exists, as is so frequently found, combined frontal and ethmoidal suppuration, the ocular symptoms are increased in severity. In these cases, Bryan has found the visual field for colours always narrowed and exophthalmos more pronounced than in simple uncomplicated frontal sinusitis. In one case of this kind reported by him, in which there was chronic suppuration in the frontal sinus and ethmoid cells, an irido-choroiditis supervened. When the sphenoidal sinus is the seat of suppuration, the ocular symptoms may be marked. In a case reported by this author, the first examination revealed a complete paralysis of the right external rectus muscle only. There were no other eye symptoms present. About two months later, there was paralysis of both external recti, and the patient further complained of great occipital pain, and pain upon the vertex. There was profuse fœtid discharge from both nostrils and a bulging forward of the posterior wall of the naso-pharynx; the frontal ethmoidal and maxillary sinuses were healthy. The sphenoidal sinus was opened and free drainage of pus established. In this case no pressure on the optic nerve was induced as is usually found, but it was limited to the sixth nerve on either side.

Ocular complications are more rarely met with in maxillary empyema, but certain symptoms of a reflex origin do occasionally occur; direct extension of the suppurative process may give rise to orbital abscess.

Nasal and sinus disease as a cause of neuralgia and headache is of considerably greater practical importance than is sometimes recognised. In the discussion on Headaches held at the Portsmouth Meeting of the British Medical Association, some interesting cases were recorded by Dundas Grant (*Journ. Laryngol.*, London, Sept. 1899). Pain in the distribution of the supraorbital nerve may result from frontal sinus suppuration, but it may exist in the same locality from disease of any of the sinuses. In the chronic forms of suppuration, where the neuralgia may be pronounced, the true cause may be overlooked. In addition to the cases reported by Grant in which the treatment of undoubted nasal or sinus mischief relieved the subjective symptoms, an interesting case of occipital headache was recorded where no inflammatory or obstructive change could be found in the nose. There was, however, abnormal tenderness on pressure upon the anterior end of the left inferior turbinated body. As the nerve supply of this region is a branch of the anterior dental nerve, attention was directed to the incisor and canine teeth; there was tenderness over the left lateral upper incisor, and when percussed, pain was felt in the nose. After extraction of this tooth, the occipital neuralgia disappeared.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Prevention of Bubonic Plague.

Dr. **Bitter** (director of the Hygienic Institute, Cairo) discusses the preventive measures in plague (*Ztschr. f. Hyg.*, Leipzig, Bd. xxx. Heft 3). As regards Haffkine's preventive inoculation, he thinks that the degree and duration of the immunity it confers are not such as to entitle it to be trusted as the one, or even the chief means for combating plague. The statistics of incidence and case mortality among the inoculated and uninoculated are vitiated by the circumstance that the similarity of conditions as regards exposure to infection, sanitary surroundings, etc., is not sufficiently proved. When such similar conditions are attained, as when families are taken only portions of whose members are inoculated, the results are less favourable. Moreover, the practice of such a measure is surrounded with great difficulties. For complete protection, compulsory inoculation would require to be adopted, and in India this would present peculiar difficulties. There is no parallel between this operation and vaccination against small-pox. The latter is done in infancy, confers immunity for a long period, and by periodic revaccination can produce a practically immune population.

Besides, compulsory vaccination was only adopted when general sanitary measures were proved to have little or no effect.

The means by which plague is spread indicates the preventive measures that should be adopted. Though by coughing pneumonic cases may spread it within a short radius, the spread by the atmosphere to any distance is excluded, as drying kills the bacillus.

The influence of rats has been much exaggerated. In Jeddah, after the plague had almost entirely disappeared, dead rats continued to be found in the streets and bazaars, and in those animals plague bacillus was found, while during his three months' visit to Bombay as a member of the Egyptian Plague Commission, no rats dead of plague were found, though the disease was raging at the time. Thus the infection of rats seems to have no causal connection with the spread of plague to the human subject, but is to be viewed as a parallel occurrence.

Neither drinking-water nor food has any share in the spread. Sudden explosive outbreaks, so characteristic of epidemics caused by drinking-water, are never seen in plague. He holds that mild cases, which may readily escape detection, cannot spread infection, and, in opposition to the views of Kitasato and others, considers convalescent cases non-infective.

The source of infection is the patient and all objects that have been in contact with him. Hence the measures to be adopted are—(1) Prompt notification of the disease, (2) isolation of the patient in hospital, and segregation of contacts, (3) disinfection of the infected dwelling and its contents.

Opening up of infected houses (which have, as a rule, no means whatever for the entrance of fresh air or light) he ranks among the unhygienic measures which he attributes to the influence of Mr. Haffkine, who, indeed, he excuses on the ground of not being a medical man. He considers it in the highest degree regrettable and dangerous that an otherwise clever investigator, whose hygienic knowledge he ranks at zero, should have been followed as an authority on plague prevention (!). Disinfection is with him the important measure, and the perfunctory way in which it has been carried out one of the chief causes of failure in stamping out plague.

MM. Calmette and Salimbeni (*Ann. de l'Inst. Pasteur*, Paris, December 1899) discuss the outbreak of plague at Oporto, and the result of their work there. On 9th July 1899, the director of the Public Health Service of Oporto reported to the Portuguese Government that cases of plague had occurred there, but for some reason or other the city was not declared infected till 9th August, when a Commission, which had been appointed, confirmed the report of the health officer. Though there had evidently been cases occurring from spring onwards, the first reported attack occurred on 5th June. The first six cases were dock labourers, the next four cases being in the same quarter among women who were employed in repairing jute sacks used in discharging grain from the ships. At first the infection was believed to have been brought by the ship *City of Cork*, trading with Indian merchandise from London, but the authors think that the disease was brought two or three months before this alleged infection, in bales of cotton or grain coming direct from infected ports, these goods containing plague-infected rats. These rats dying in the sewers of Oporto, infected the rats there, and these getting into the houses, infected the occupants. The methods of spread were—(1) By ingestion of infected articles of diet, (2) by bites from the insects on the infected rats, and (3) by sputum from primary or secondary pneumonic cases.

The locality first affected is close to the River Douro, the houses being damp and insanitary, and inhabited by the poorest class of labourers. A single room may contain five or six, and sometimes even fifteen occupants, and on the ground floors the people share their rooms with their pigs, goats, etc. On entering such rooms one is almost suffocated with the disagreeable odours. There is no method of sewerage, and the streets are so narrow that the sun can never shine in them. Of late, cases have appeared in the more sanitary quarters with a more elevated site. In the earlier part of the epidemic the average case mortality was 43·7 per cent. (45·6 per cent. in the city, and 38·8 per cent. in hospital).

After their arrival on 3rd September, Yersin's serum was used in the hospital as a curative treatment. From 3rd September to 18th November, of 143 cases so treated the case mortality was 15·3 per cent., while of 72 cases in the city which were not treated with serum the case mortality was 63·7 per cent.

For successful treatment with serum they consider that all cases should at once get an intravenous injection of 40 c.c., followed by two subcutaneous injections of 40 c.c. each in the first twenty-four hours, and 10, 20, or 40 c.c. subcutaneously daily until the fever entirely subsides.

As a prophylactic the serum confers immunity almost immediately, but this lasts only about fifteen days. Haffkine's method confers longer immunity, but it does not appear till eight or ten days after inoculation. They state that if an animal be inoculated with Haffkine's fluid, and at the same time with a small quantity of plague bacillus (insufficient in most cases to produce death), the animal dies of plague. Hence they consider that Haffkine's treatment is apt to aggravate the evolution of plague among persons in whom it is incubating. They will discuss in a later paper the effect of mixing some Yersin's serum with Haffkine's fluid, which practice they adopted for the purpose of preventing the febrile reaction of the latter, and also conferring immediate immunity pending the more durable immunity produced by Haffkine's fluid.

As preventive measures they recommend—(1) Killing of all rats and cleansing the sewers, so that they may not breed there; (2) disinfection of houses by sublimate or creoline, and flaming the walls when made of brick or stone; (3) "stoving" all objects that can be sterilised by moist heat. A sanitary cordon is useless. It was tried in Oporto, and failed to prevent plague spreading beyond the city, while it nearly produced a famine by preventing importation of food from the neighbouring villages. The improvement of the dwellings is most important. It is necessary that the authorities construct new sanitary dwellings to take the place of those bordering on the river. "Experience," they say, "has taught them that the plague is first propagated in the insanitary quarters, deprived of air and sunlight, and where dirt and overcrowding reign."

Gotschlich (*Ztschr. f. Hyg.*, Leipzig, Heft 3, Bd. xxxii.) describes three cases of pneumonic plague, two secondary and one primary, in which, for weeks after apparently entire recovery, the sputum contained virulent plague bacilli. The method followed for separating and identifying the organism was to inoculate an animal directly with the sputum, and with its peritoneal exudate to inoculate another animal. The clinical features of the cases are given in detail. The bacillus was found till six, nineteen, and forty-two days after the patients had been respectively able to leave their beds. Of ninety-six cases in Alexandria there were nine pneumonic cases, six of which died.

Nehring (*Hyg. Rundschau*, Berlin, 15th Dec. 1899) describes the method used at Hamburg for the destruction of rats, as a means for protecting that city from importation of plague. Phosphor paste is put into the abdominal cavity of the bodies of dead smelts, and these are placed here and there on dry parts of the sewer, and renewed weekly. It has been very successful. Most of the rats are swept down in the sewage. No harm has resulted either from the drains or in the Elbe after receiving the sewage.

BIOLOGICAL METHOD FOR DETECTION OF ARSENIC.

ABEL and Buttenberg (*Ztschr. f. Hyg.*, Leipzig, Heft 3, Bd. xxxii.) communicate the result of their experiments. Long ago Gmelin showed that among rooms with arsenical wall-paper, those situated on ground floors or in other conditions favouring dampness were most dangerous to live in. It has long been known that besides arsenical particles in the dust of such rooms, the atmosphere contains arsenic in some gaseous form. Abba showed that this was due to the action of moulds, which derived their necessary moisture and nourishment from the paste on the wall-paper. The nature of this gaseous arsenical compound is not known, but it possesses the garlic smell characteristic of arseniuretted hydrogen. *Aspergillus glaucus* and *niger*, and in form of *Mucor mucedo*, can produce this change, but *Penicillium brevicaule* is the most suitable.

The following is their method:—The suspected article reduced to a state of fine division is added to moistened bread-crumbs contained in a 100 c.c. flask. After sterilisation the contents are inoculated with the mould, the cotton plug of the flask covered by a caoutchouc cap, and the whole set to incubate for one or two days at 37° C. If arsenic be present the garlic odour is readily detected on removing the caoutchouc cap. The authors think their method generally applicable and valuable when the arsenic is present in very small quantity. One-tenth of a milligram is readily detectable.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society.—Clinical meeting, *20th December* 1899.—Mr. A. G. **Miller**, President, in the chair.—Dr. **Bruce** showed—(1) A case of progressive muscular atrophy, of the peroneal type; (2) a case of senile chorea, following fracture of the leg; (3) a case of convulsive tremor, probably an example of paramyoclonus multiplex; (4) a case of injury to the lumbo-sacral nerve roots; (5) a case of infantile paralysis affecting only the muscles of the hand.—Dr. **Norman Walker** showed—(1) Two cases of ichthyosis in the same family; (2) a case of acne necrotica; (3) a case of favus, and two cases of lupus under treatment by the X-rays, all showing marked improvement; (4) (for Dr. Allan Jamieson) a case of leprosy.—Dr. **James** showed two cases of hyperkinesis.—Dr. **Gibson** showed a patient suffering from a descending sclerosis of the brain and spinal cord with symptoms of pseudo-bulbar paralysis.—Mr. **Stiles** showed—(1) An infant after operation for acute ileo-cæcal intussusception; (2) a boy after Mikulicz's operation for disease of the posterior tarsus; (3) a patient who suffered from acute thyroid cachexia, after excision of a suppurating goitre; (4) a patient after excision of a large (simple or malignant?) lymphoma of the neck; (5) a patient after avulsion of the entire scalp.—Dr. F. D. **Boyd** showed—(1) A case with some of the signs and symptoms of syringomyelia; (2) a case of neuritis, with involvement of both facial nerves; (3) a case of neuritis after confinement, to illustrate the question of prognosis.—Dr. A. C. **Sym** showed specimens from a case of morbus Ludovici.—Mr. **Cotterill** showed—(1) Specimen of tumour of the brain; (2) specimens of urethral calcŭlus (two cases); (3) a fatty tumour from the substance of the deltoid.—Dr. **Gibson** showed a specimen of myomalacia cordis, with microscopic slides to illustrate the same.—Dr. **Purves** showed a specimen of exostosis of the femur.

17th January 1900.—Mr. A. G. **Miller**, President, in the chair.—Dr. **Norman Walker** showed a case of acute varioliformis.—Dr. W. **MacGillivray** showed a patient after fracture of the vault of the skull.—Dr. **Charles Begg** read a paper on "Clinical Experience with Salol in the Treatment of Small-pox," which he began to use in China. Its use had been suggested to him from his observing that a patient who was peculiarly susceptible to mosquito bites did not suffer the least inconvenience from this when taking salol. This led Dr. Begg to try the effect of salol in irritating skin diseases associated with much itching, and with good results. He then tried it in cases of small-pox, and he found that even in very severe confluent cases its use apparently arrested the eruption at the stage of vesication, so that the stage of maturation and suppuration was not reached save in a very few isolated vesicles. He attributed this result to there being probably considerable excretion of salol or some by-product by the skin and lungs.—Mr. **Shaw M'Laren** read a paper on "Permanent Dislocation of the Patella." Thirty cases in all had been recorded, and in all some deformity of the legs had been noted at birth. There were also present, as a rule, rickets, genu valgum, outward rotation of the leg, and a badly developed patella. In the case cited, all of these conditions were present. The patient now, four years after the operation, has a useful limb, and can walk with ease.—Dr. **Harvey Littlejohn** read a paper "On a case of Murder and Suicide by Cut Throat," which will appear in a future number of this Journal.

Edinburgh Obstetrical Society.—*Wednesday, 10th January* 1900.—Dr. **Milne Murray**, President, in the chair.—Professor **Simpson** showed specimens from a Porro-Cæsarean section.—Dr. J. W. **Ballantyne** showed a specimen of what was sometimes called "fœtus in fœtu."—Dr. **James Ritchie** read "Notes of a Case of Albuminuria, Multiple Pregnancy, Papyraceous Fœtus, and Placenta Prævia."—Dr. **Berry Hart** read a paper "On the Cause of the Differentiation of Connective Tissue in the Human Fœtus, with reference to the Essential Nature of the Hydatid Mole." Dr. Hart first drew attention to the stages in the development of connective tissue in the human fœtus, and pointed out that the myxomatous stage or variety was permanent in the umbilical cord. At the villi of the placenta the connective tissue was at full time not quite fully formed, while in the rest of the fœtus it became near the full time quite of the advanced or fully formed variety except in the vitreous and the dental pulp. In the cord there was no capillary vascular supply, and no lymphatics or nerves. In the villi, capillaries were present, and the villi were in contact with maternal tissue. In the vitreous of the adult there was no blood supply, but a lymphatic one; while in the dental pulp there was a blood supply, but no lymphatics. Dr. Hart believed that in the fœtus the thyroid secretion caused the development of the myxomatous tissue on to a fully formed type, when vascular and lymphatic supply were both present. The thyroid was active in the fœtus, as its development began in the first month, and a case had been recorded where myxœdema in the mother was cured by pregnancy, evidently from thyroidisation on the part of the fœtus. Dr. Hart had also, in a two-and-a-half-months fœtus, found the thyroid very vascular and with colloid secretions. Now, the cord had neither vessels nor lymphatics—it remained myxomatous because the thyroid secretions did not reach it. The connective tissue of the villi could get a certain amount, and thus advanced further. The approximation to a myxomatous type in the vitreous and dental pulp was probably explained by the deficient vascularity in the one and the absence of lymphatic supply in the other. Finally, Dr. Hart gave his reasons for believing that the hydatid mole was acute myxœdema of the chorion, and concluded with some remarks on the probable influence of these views as to prevention of deciduoma malignum. Dr. Hart then gave a demonstration on the early changes at the caudal end of the primitive gut in the human embryo.

Forfarshire Medical Association.—10*th January* 1900.—Dr. **Templeman** in the chair.—Professor **Kynoch** showed a child from whom he had removed a renal sarcoma three years before by laparo-nephrectomy. Six other cases of laparo-nephrectomy on children under 2 years of age had been reported as alive and well three years after operation. Although only 5 per cent. of all reported cases had recovered, the chance of a cure ought to be offered.—Dr. **M'Gillivray** showed—(1) Boy with rupture of the choroid;

(2) patient who after injury had suffered from a dilatation of one pupil, which he was inclined to consider due to irritation.—Dr. **M'Vicar** showed a patient with a large cystic swelling, which extended from the anterior border of the sterno-mastoid to the middle line, with branching processes under the same muscle and up into the floor of the mouth. The fluid was viscid and clear, and when it escaped by the mouth had a sweetish taste. It appeared to be a bronchial cyst.—Dr. **Gray** showed, for Professor M'Ewan, specimens of —(1) Fracture of the base of the skull; (2) epithelioma of the tongue; (3) limb from a case of senile gangrene.—Dr. **Gray** showed a cast of an arm with lipomata.—Professor **Kynoch**—(1) Illustrated by a painting an unusual pigmentation of the central linear cicatrix, as well as the stitch scars of a case of ovariotomy he had performed during pregnancy. A scar of two years' duration on the breast had remained unaffected. (2) Showed a multilocular ovarian cyst, and remarked on the few adhesions present, notwithstanding the fact that part of the cyst had been ruptured by an accident some time previously.—Dr. **M'Vicar** showed —(1) An ovarian cyst, which, in view of the clinical history and the naked-eye and microscopic appearance, seemed to be an abscess of the ovary; (2) a vermiform appendix with the lumen practically occluded.

Glasgow Medico-Chirurgical Society.—12*th January* 1900.—Dr. G. S. **Middleton**, President, in the chair.—Dr. J. **Barr Stevens** showed a case of superficial emphysema occurring during labour.—Dr. **Edgar** read a paper on "Some Cases of Post-climacteric Hæmorrhage." Of 470 cases of disease of the female pelvic organs which came under his notice, sixteen were post-climacteric hæmorrhage. Nine of these sixteen were due to carcinoma of the portio vaginalis, and one to carcinoma of the corpus uteri. Of the first nine, in two cases only was the disease limited enough for radical operation, and both died within a year from recurrence. Of the remaining six cases, two were due to uterine fibroids, three to cervical polypus, and one to cystic ovary. — Dr. **Kelly** read notes on some gynœcological cases and showed pathological specimens—(1) Case of hydrosalpinx, strangulated and fixed behind the uterus. The tube was removed. The patient, four months pregnant, made a good recovery, and was delivered of a child at full time. (2) Two cases of double pyosalpinx, in which total vaginal extirpation was performed. (3) Three cases of pyosalpinx, removed by abdominal section. (4) Small parovarian cyst, which presented symptoms of an inflammatory condition. (5) Case of tubal pregnancy, showing the fœtus lying in its sac surrounded by blood clot. (6) (*a*) Myoma of uterus. Total extirpation performed. (*b*) Myomata complicating pregnancy. The body of the uterus was occupied by a large and rapidly growing myoma. To the left cornu of the uterus was attached by a short pedal, another myoma as large as an orange. The uterus was five months pregnant. Total extirpation was performed, and followed by a good recovery. (7) Two cases of vaginal extirpation for cancer of cervix. In one case there was a hydrosalpinx on the left side, and in the other there were small myomata on the fundus.

ANALYTICAL REPORTS.

THE SURGEON'S DRESSING-CASE FOR OPERATIONS.

(Azoic Dressing Company, Charford Mills, Bromsgrove.)

THE Azoic Dressing Company has sent us a sealed paste-board box described as above. It contains a sufficient supply of absorbent cotton wool, lint, gauze, iodoform gauze, waterproof tissue, bandages, drainage-tubes, and safety-pins as may be required for an ordinary operation, or for dressing a case after operation. They are all of the best quality, and are described and guaranteed as perfectly sterile. We can quite appreciate that this box of dressings may be of great use in general practice.

A.D.C. SURGICAL BANDAGES.

THESE are sent out by the same manufacturers in sealed boxes, each containing a dozen 3-in. gauze bandages of the regulation length of 6 yards. A practical improvement consists in each bandage being securely wrapped up in gummed paper, so that when sterilised as described they are certainly protected from contamination by the fingers or in the doctor's hand-bag. They may be safely recommended as the best gauze bandages we have seen.

CREDE'S SILVER SALTS.

(Von Heyden, Dresden. Agents: Burgoyne, Burbidges & Co., London.)

ACTOL, the lactate of silver, and itrol, silver citrate, are preparations of organic acid salts of silver, suggested by Crede of Dresden for their germicidal properties.

Crede has demonstrated that these silver compounds are as powerfully antiseptic in their actions as corrosive sublimate, while at the same time they are non-poisonous and unirritating. The only drawback to their use is the dark stains which may be produced by them in linen, but these can easily be removed with mercuric chloride and common salt solutions. Actol is much more soluble in water than itrol, 1–15 against 1–3800, and is to be used in solutions varying with the purpose from 1–200 to 1–2000; the second from 1–4000 to 1–8000. The latter is most suited for washing out cavities, for gargles, and injections. Gauze, silk, and catgut can be prepared with them, as directed in the makers' descriptions. In addition to these two silver salts von Heyden manufactures Collargolum, or Crede's Soluble Metallic Silver, and Unguentum Crede, an ointment of soluble metallic silver, both of which have been largely used in obstetric septic cases and poisoned skin affections with a considerable meed of success. They are introduced into the system by inunction, and although the fæces may become dark in colour, argyria is said never to occur.

OBITUARY.

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Sir James Paget, Bart., F.R.C.S., F.R.S., D.C.L. (Oxon.), LL.D. (Cantab.). Born at Yarmouth, 11th January 1814. Died in London, 30th December 1899.

Almost on the last day of 1899 there passed away one who played a great part in making the history of surgery and pathology of the nineteenth century.

Sir James Paget—full of years and honours, with a great work completed, and assured of the honour and respect of colleagues and pupils of many nations and ages—passed, not from a busy and active life, but from a peaceful retirement, in which he spent the last few years of his life, and in which he was surrounded by the care and affection of those by whom he was held most dear.

Without any special advantages of early education, except those valuable influences exerted by his mother, father, and brothers, James Paget appears to have very early given evidence of his great powers of observation and dogged perseverance, and to have been a lad possessed of a thoughtful mind, and lovable though strong character. Commencing his medical apprenticeship in 1830 with Mr. Charles Costerton, of Yarmouth, he devoted himself, not only to his professional duties, but also to making himself thoroughly familiar with the work of the master-minds of that fruitful period—just before and after the accession of the Queen. His practice—routine to some men—became to him a field for accurate observation, and before he went to St. Bartholomew's in 1834 he had laid up a store of information and experience which formed a sure basis for his later work.

In his first year at St. Bartholomew's he discovered and described very accurately the *Trichina spiralis* in muscle, and practically swept the board of the prizes for which he competed.

This year was but a type of the future years in Sir James Paget's life. With his keen powers of observation, his industry, his marvellous memory, and his great power of exposition, he did more perhaps to study and introduce the new pathology of that period—first to the men at St. Bartholomew's and then to the surgeons of this country—than any man who has recently passed away from amongst us. First as Demonstrator of Morbid Anatomy and Curator of St. Bartholomew's Museum, and then in the descriptive catalogue of the pathological specimens contained in the Museum of the Royal College of Surgeons—two volumes of which appeared, one in 1846, one in 1849—he laid the foundation of his reputation as a great and original pathologist, and stored up that marvellous fund of accurate information and closely reasoned deduction which placed him second only to John Hunter amongst our great surgical pathologists. Although his reputation as a pure surgeon was deservedly high he did not take such an outstanding position as others of his colleagues, though no man of the century has left such an impress on British surgery (if we leave out the extremes of John Hunter and Lord Lister) as has Sir James Paget.

This is no place for a list of his works or a catalogue of his distinctions, which are so numerous that they scarcely could be classed as such, but all will remember that, in addition to holding the offices and completing works mentioned above, he was author of "Lectures on Surgical Pathology," of "Lectures on the Processes of Repair and Reproduction after Injuries," of "Lectures on Inflammation," and of "Clinical Lectures and Essays." His numerous other addresses and lectures, if collected, would form a history of the surgical pathology of his time such as none but he could have written.

In reading over the notices of Paget by his old friends, one cannot but be struck by the unanimity with which all speak of his intense personal and professional conscientiousness; and we find him late in life, editing, supplementing, and originating just as he had done in the earlier days of his quiet, though strenuous existence. Nothing seemed to escape the grasp of his calm and well-balanced mind; observation and research were with him the preliminary and necessary steps to the formation of an opinion, a judgment that was merely reflected in the ease and precision of his speech. One of his old pupils, Mr. Butlin, refers to what he calls "the one great talent in which he appeared to me to surpass any person I ever met—his extraordinary skill in the use of language; he was not merely a master of our language, he was an artist in words and phrases. Whether he wrote or spoke he used a diction and phraseology peculiarly his own, his thoughts were the thoughts of an original mind, but they were rendered a hundredfold more beautiful by the graceful and original terms in which they were expressed. I never read his works without wondering at the skill and nicety with which he used our own language." In his language as in his work, Paget was more than brilliant; he was effective because he was thorough, accurate, conscientious; he illuminated every object he took in hand, and he has left a legacy, not only of matter, but of thought and of method, which, to his personal pupils and friends, must be of priceless value, but which, even to those who know him only through his works, has laid them under a debt of obligation they can only discharge by a continuance of the same faithful study of the subjects that had become a part of his very being.

G. Sims Woodhead.

Sir Richard Thorne Thorne, K.C.B., M.B., D.Sc., LL.D., F.R.S., F.R.C.P.

By the death of Sir Richard Thorne, which occurred on 18th December 1899, in London, the public health service of the country has sustained a great loss. He had been for some time in poor health, but was engaged at his work practically up to the day of his death, which resulted quite suddenly from embolism, originating in varicose veins of the leg. Sir Richard Thorne was born in 1841, and was the son of a banker in Leamington. After receiving a part of his early education in Germany and Paris he commenced the study of medicine, and entered at St. Bartholomew's Hospital, where he had a distinguished career.

Being offered a post under the Medical Department of the Privy

Council—or, as it afterwards became, the Local Government Board—by Sir John Simon, its distinguished head, Sir Richard Thorne entered on the path which was ultimately to lead to his occupying the highest position in the sanitary service of the country, and render his name one of the foremost amongst those who have, by their unwearying zeal and scientific work, advanced sanitary administration and preventive medicine to the position it has gradually attained during the last quarter of a century. Coming after such men as Simon and Buchanan to the post of principal medical officer of the Local Government Board of England, Sir Richard Thorne had no easy task before him, if he was to emulate the brilliant work they effected; but it will be universally admitted that he fully justified his appointment to that important post, and that his record of work, short though the period of his activity in it was, amply maintains the traditions of the office. Sir Richard Thorne was not brilliant, in the sense of initiating new and striking advances in preventive medicine, but he was eminently practical; he had a profound knowledge of all matters relating to the public health, based on a wide experience and careful observation, and above all he was gifted with an attribute of even greater value to the head of a great department, namely, common sense. If we add to these qualities an invariable courtesy and a kind heart it is not difficult to understand how Sir Richard Thorne came to be regarded as a friend by the medical officers of health throughout the country, and enjoyed their esteem and confidence. Any notice of Sir Richard Thorne would be incomplete without a reference to his championship at the International Congresses held at Rome, Dresden, Paris, and Venice, of the view that quarantine is a barbarous method of attempting to prevent the importation of disease from country to country, and that the chief line of defence must be in a country's own sanitary improvement and administration—a view now practically admitted by Continental opinion after years of opposition. In 1891 he delivered the Milroy Lectures, before the Royal College of Physicians of London, taking as his subject "The Natural History and Prevention of Diphtheria," a subject on which no one was better qualified to speak with authority. His other writings included monographs upon the control of tuberculosis, the progress of sanitary science in the Victorian era, and on many other subjects dealing with questions of public health.

George Elder, M.D., F.R.C.P.Ed.

It is with the deepest regret that we record the death, from acute pneumonia, of Dr. George Elder, of 7 Leopold Place, Edinburgh, at the early age of 30. The son of an East Lothian farmer, he was educated at the Knox Institute, Haddington, and at Edinburgh University, from which he graduated as M.B. C.M. in 1891 with first-class honours, after a very distinguished undergraduate career. After a couple of long voyages as ship's surgeon, he filled the position of Resident Physician, successively in the Royal Infirmary, the Sick Children's Hospital, and the Royal Maternity Hospital, and then commenced private practice in Edinburgh. In 1896 he graduated as M.D., and was elected a Fellow of the Royal College of Physicians.

His success in practice became assured from the first, and he devoted himself closely to clinical work by becoming University Medical Tutor, Physician to the New Town Dispensary, and Assistant-Physician to Leith Hospital. Just last year he published, along with Dr. Fowler, a work on "Diseases of Children," which has been very favourably received, and he was, besides, the author of several valuable contributions, embodying the results of original research on the cranial circulation, peripheral neuritis, and the maternal and fœtal blood at birth.

George Elder's character was a particularly amiable and lovable one. Possessed of very high abilities, of which he had made good practical use, he had acquired an unusually sound and accurate knowledge of his professional work, especially in the domain of clinical medicine.

His character for probity and straightforwardness was of the very highest, and by his early death the medical profession in Edinburgh has lost a colleague whose influence for good would have gone on steadily extending to a much wider circle of friends and patients.

MATTHEW LOUIS HUGHES, L.R.C.P. (Lond.), M.R.C.S.

CAPTAIN HUGHES, R.A.M.C., is one whose untimely end, while gallantly serving his country at the battle of Tugela River, all will deplore.

He was a distinguished student at King's College, London, and afterwards passed through Netley with distinction, being Parkes prizeman of his year. His scientific investigations in regard to Malta fever, and an outbreak of gastro-enteritis at Aldershot last year, indicated the possession of qualities which must have ensured for him a distinguished career in the profession which he had chosen, and of which he was already known as a conspicuous member.

MEDICAL NEWS.

NEW YEAR HONOURS.

AMONGST the honours announced on New Year's Day, as about to be conferred by Her Majesty, several are to be vouchsafed to members of the medical profession. Sir LAUDER BRUNTON's elevation to the dignity of knighthood is a fitting recognition of his world-wide fame as a scientific physician, while the similar honour to be granted to Sir HENRY LOVELL, C.M.G., is a well-merited reward for meritorious work in our Colonial Empire. The HON. JOHN ALEXANDER COCKBURN, who is to receive the K.C.M.G., has given the greatest impetus to Australian education and Australian unity. Dr. PATRICK MANSON, who will receive the companionship of the same order, has done yeoman service at the Colonial Office and the School for Tropical Diseases, while his scientific labours on filariasis and malaria are of universal celebrity. Dr. JOHN PRINGLE, Dr. WORDSWORTH POOLE, and Dr. ARCHIBALD DONALD MACKINNON, who will also receive the C.M.G., have rendered valuable services to their country in the Colonies. To all these gentlemen we desire to offer our warm congratulations on their well-merited honours.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING DECEMBER 30, 1899; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°.	Below 42°.					
Mean .	37°·5	[1] 45° [2] 2362°	163° 919°	3·4	32·0	38	1276	3°·3
Observed	36°·7	[1] 46° [2] 2586°	239° 969°	3·6	33·2	22	1340	3°·06
Difference	−0°·8	[1] + 1° [2] +224°	+76° +50°	+0·2	+1·2	−16	+64	−0°·24

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING DECEMBER, AND SINCE JANUARY 1, 1899. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1897	[1] 1,310 [2] 13,481	229·2 196·5	216 2586	37·8 37·7	117 1260	20·5 18·4	324 2651	56·7 38·6	136 1505	23·7 21·9
Actual Deaths and Rate per 10,000	[1] 1,138 [2] 13,177	199·1 192·1	211 2765	36·9 40·3	137 1261	23·9 18·4	267 2256	46·7 32·9	135 1525	23·6 22·2
Difference from Mean	[1] −172 [2] −304	−30·1 − 4·4	−5 +179	−0·9 +2·6	+20 + 1	+3·4 ±0	−57 −395	−10·0 −5·7	− 1 +20	−0·1 +0·3

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1897	78 887	13·6 12·9	29 348	5·1 5·0	110 990	19·3 14·4	106 1280	18·6 18·6	50 584	8·9 8·5
Actual Deaths and Rate per 10,000	70 1003	12·2 14·6	26 332	4·5 4·8	123 1048	21·5 15·3	97 1276	17·0 18·6	52 700	9·1 10·2
Difference from Meau	− 8 +116	−1·4 +1·7	− 3 −16	−0·6 −0·2	+13 +58	+2·2 +0·9	−9 −4	−1·6 ±0	+ 2 +116	+0·2 +1·7

* NOTE.—The figure [1] denotes the data for December, [2] for year to date.

The five weeks which closed the year of 1899 yield a mean temperature nearly a degree below the normal, but the exclusion of the first of the five (that ending 2nd December) gives for the last four a value rather more than 3° below the mean. The difference between the mean temperature of the first and the third of the series amounts to as much as 17°·8 (47°·2—29°·4). The accumulated degrees of warmth are normal, of cold greatly increased; the excess equalling 46 per cent. of the average figure. The rainfall is practically normal; the hours of bright sunshine very deficient; the daily variability of temperature rather less than usual.

For the whole year the accumulated day-degrees over 42° F. show an excess of 224°, or 9·4 per cent. of the total expected; those below 42° F., an excess of 50°, or 5·4 per cent., an excess entirely due to the cold in December. The rainfall is 1·2 in. over the mean, the number of hours of bright sunshine 5 per cent. in excess of the average.

The total number of deaths recorded is again much below the mean, showing a deficiency equal to 13 per. cent. of the total looked for. Among the classes of diseases discussed, respiratory disorders show the largest decrease, although (as has been noted several times before here) deaths from pneumonia are above the average. Deaths from circulatory diseases exceed their mean by 17 per cent. Influenza is recorded as the cause of death in fourteen cases.

For the whole year the total mortality is lower by 2·2 per cent. of the calculated figure. The various values for the separate classes of disease noticed may be expressed as follows:—

DECREASE	Total deaths	2·2	per cent.	of total expected.
	Respiratory	14·9	,,	,,
	Urinary	4·6	,,	,,
INCREASE	Constitutional	6·9	,,	,,
	Nervous	1·3	,,	,,
	Digestive	13·0	,,	,,
	Pneumonia	5·8	,,	,,
	Cancer	19·86	,,	,,
AVERAGE	Circulatory	—	,,	,,
	Phthisis	—	,,	,,

The decrease in deaths from respiratory disorders, and the increases from digestive and cancerous diseases, are very prominent. The increase under cancer is extraordinary. In place of every 100 deaths from this disease, as in former years, practically 120 succumbed to it.

EDINBURGH
MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

ON THE METHOD OF ZADIG IN THE ADVANCEMENT OF MEDICINE.[1]

By George W. Balfour, M.D., LL.D., F.R.C.P.Ed.

"There's rosemary, that's for remembrance."

In addressing an audience like the present, I can scarcely be wrong in assuming that there are few among you who have not read with interest the tales of that wonderful detective—Sherlock Holmes—whose untimely decease we who have known him have never ceased to deplore—though I daresay many of you are wondering what Sherlock Holmes has to do with medicine or with a medical society, beyond the fact that his gifted creator is a medical man. Still, those of you who have followed with attention the masterly analysis by which he has unravelled and reduced to simplicity the most difficult and unpromising problems, need not be told that the method of reasoning by which his wonderful discoveries have been made is precisely that by which not only medicine but every other science has been most surely advanced. The wisest of men has authoritatively declared that "there is nothing knew under the sun;" it will not therefore surprise you that Sherlock Holmes had a great prototype,—one, indeed, whose name is so indissolubly associated with the method of reasoning employed, that it is everywhere known as the method of Zadig. Zadig is supposed to have lived at Babylon in the days of King Moabdar; disgusted with life, he is said to have fled from the city to a secluded retreat on the banks of the Euphrates, where he beguiled his solitude by the study of nature. But a habit of careful observation, engendered by such a life, leads to the detection of many trifles which would otherwise escape notice, and these when correctly reasoned upon may lead to discoveries that seem most mysterious and are really marvellous. Strolling along one day near a small wood, Zadig saw hastening that way one of the queen's chief eunuchs, followed by a troop of officials, who appeared like men distraught, running hither and thither as if in search of some lost treasure.

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[1] An Address delivered at the opening of the York Medical Society on October 11, 1899.

"Young man," cried the eunuch, "have you seen the queen's dog?"

Zadig answered modestly, "A bitch, I think, not a dog?"

"Quite right," replied the eunuch; and Zadig continued, "a very small spaniel who has lately had puppies; she limps with the left fore-leg, and has very long ears."

"Ah! you have seen her, then?" said the breathless eunuch.

"No," answered Zadig, "I have not seen her; and I really was not aware that the queen possessed a spaniel."

By an odd coincidence, at the very same time the handsomest horse in the king's stable broke away from his groom in the Babylonian plain. The grand huntsman and all his staff were seeking this horse with as much anxiety as the eunuch and his people the spaniel, and the grand huntsman asked Zadig if he had not seen the king's horse go that way.

"A first-rate galloper, small-hoofed, 5 ft. high; tail, 3½ ft. long; cheek-pieces of the bit of 23-carat gold; shoes, silver?" said Zadig.

"Which way did he go? Where is he?" cried the grand huntsman.

"I have not seen anything of the horse, and I never heard of him before," replied Zadig.

The grand huntsman and the chief eunuch made sure that Zadig had stolen both the king's horse and the queen's spaniel, so they haled him before the court of justice, which at once condemned him to the knout and to transportation for life to Siberia. But the sentence was hardly pronounced when the lost horse and spaniel were found. So the judges were under the painful necessity of reconsidering their decision; but they fined Zadig 400 oz. of gold for saying he had seen that which he had not seen.

The first thing was to pay the fine; afterwards Zadig was permitted to open his defence to the Court, which he did as follows:—

"Stars of justice, abysses of knowledge, mirrors of truth, whose gravity is as that of lead, whose inflexibility is as that of iron, who rival the diamond in clearness, and possess no little affinity with gold; since I am permitted to address your august assembly, I swear by Ormuz that I have never seen the respectable lady-dog of the queen, nor beheld the sacrosanct horse of the king of kings.

"This is what happened. I was taking a walk towards the little wood, near which I subsequently had the honour to meet the venerable chief eunuch and the most illustrious grand huntsman. I noticed the track of an animal in the sand, and it was easy to see it was that of a small dog. Long faint streaks upon the little elevations of sand between the foot-marks convinced me that it was a she-dog with pendent dugs, showing that she must have had puppies not many days since. Other scrapings of the sand, which always lay close to the marks of the forepaws, indicated that she had very long ears; and as the imprint of one foot was always fainter than those of the other three, I judged that the lady-dog of our august queen was, if I may venture to say so, a little lame.

"With respect to the horse of the king of kings, permit me to observe that, wandering through the paths which traverse the wood, I noticed the marks of horse-shoes. They were all equidistant. 'Ah,' said I, 'this is a famous galloper.' In a narrow alley, only 7 ft. wide, the dust upon the trunks of the trees was a little disturbed at 3½ ft. from the middle of the path. 'This horse,' said I to myself, 'had a tail 3½ ft. long, and, lashing it from one side to the other, he has swept away the dust.' Branches of the trees met overhead at the height of 5 ft., and under them I saw newly fallen leaves; so I knew that the horse had brushed some of the branches, and was therefore 5 ft. high. As to his bit, it must have been made of 23-carat gold, for he had rubbed it against a stone, which turned out to be a touchstone, with the properties of which I am familiar by experiment. Lastly, by the marks which his shoes had left upon pebbles of another kind, I was led to think that his shoes were of fine silver."

All the judges admired Zadig's profound and subtle discernment; and the fame of it reached even the king and queen. From the ante-rooms to the presence-chamber, Zadig's name was in everybody's mouth; and although many of the Magi were of opinion that he ought to be burnt as a sorcerer, the king commanded that the 400 oz. of gold which he had been fined should be restored to him. So the officers of the Court went in state with the 400 oz.; only they retained 398 for legal expenses, and their servants expected fees. Thus Zadig completely vindicated the correctness of his method, and the truthfulness of his deductions was acknowledged by all, but this did not prevent him from only narrowly escaping the penalty of being in advance of his generation; and had the power of the Magi been equal to their will, they would have burned poor Zadig as a dangerous innovator, whose method, logically pursued, would ultimately have overthrown all the Babylonish cosmogony, and led to their own destruction.

After all, Zadig's philosophy consisted only in the application of common-sense to matters of everyday observation. It was, if you will, a reasoning from the known to the unknown, though that seems somewhat too grandiloquent an expression to apply to the commonplace assumption, upon which every act of our daily lives is based, that we are justified by the presence of any effect in concluding as to the pre-existence of a cause adequate to produce this effect.

It is not only among philosophers or in the advancement of science that this method is indispensable, in every act of daily life we find a use for this mode of seeking the truth, and if it appears to attain its most remarkable developments in the field of science, it seems even more of a necessity for the wandering savage. From such trifling indications as a few broken twigs, a few disturbed pebbles, or imprints too faint to challenge attention from any but the most observant, Fenimore Cooper makes his "untutored savage" not only track his game, but also note the presence and the number of his unseen enemies, and guide his friends through trackless deserts safe though in the midst of foes.

Zadig's method may be employed either to tell us what is past or to predict what is to come; it may even—in certain circumstances—be employed to discover the existence of something present, though as yet unseen. Thus astronomers can calculate for us the dates at which eclipses of the sun or moon have happened in the past, or when they are to happen in the future, or they may tell us the position of the planets on any night of the world's history—a matter of some importance in the days of astrology, in attempting to predict the destiny of anyone by calculating his horoscope. In recent times, one of the most remarkable applications of Zadig's method in astronomy has been in the discovery of the planet Neptune by Adams and Le Verrier. Their attention was attracted by the erratic movements of the planet Uranus; they considered that this disturbance in the movement of Uranus was exactly such as might be produced by the attraction of another planet moving outside its orbit. Proceeding on this assumption, they calculated the probable position of this new planet in the heavens, and having thus pointed out to astronomers where to look for it, exactly in the position so defined, it was discovered on the 23rd of September 1846, by Galle of Berlin, and subsequently by other astronomers. Thus, by careful attention to such an apparent trifle as a slight erratic movement of one of the planets in its orbit, these philosophers doubled the extent of the solar system, and added to its constituents a planet eighty-four times larger than the earth, which up to that period had been entirely unheeded—it had not been entirely unobserved—but when seen, which was but rarely, it had been looked upon as merely one of those multitudinous stars that stud our heavens, and are centres of other systems with no connection with our own.

If we turn now to palæontology, we find that the method of Zadig not only enables us to reconstruct an entire animal from a fragment of a bone, but in future ages, when we shall have a larger body of facts, it will enable the biologist to reconstruct the whole scheme of life from its commencement.

It is not so long since even learned men disputed the question whether what we call "fossils" were really the remains of plants and animals, or were not merely accidental concretions in the stones in which they were found. We can imagine, therefore, the astonishment of those who were invited to assist at the fulfilment of one of Cuvier's remarkable predictions. Having received a slab from the quarries of Montmartre, in one-half of which he found a skull which he recognised as that of an opossum, Cuvier predicted that in the other half, which presumably contained the bones of the body and lower extremities, he would find the marsupial bones which would complete the identification of the animal. All happened as expected, much no doubt to the astonishment of those friends he had invited to be present. This, however, is scarcely a fair example of Zadig's method, and Cuvier was rather lucky, as there are many opossums without marsupial bones, just as there are many animals with marsupial bones which are not opossums. A more striking and more legitimate instance of this method is told us by the late Sir Richard Owen. In 1839, a sailor took Owen a fragment of bone about 6 in. long, and 5½ in. in its smallest circumference; this he urged Owen to purchase as a great curiosity, being as he said the bone of a great eagle. Owen looked at the bone, and told the would-be vendor that it was a marrow bone, and that it was impossible that the original owner of such a bone could ever have flown. Overborne by the vendor's importunity, Owen consented to keep the bone and examine it with greater care. To his astonishment Owen found the bone to be entirely different from that of any quadruped with which he compared it, and that both externally and in its internal structure it not only resembled but actually was the bone of a bird. It was not only a bird's bone, but also a marrow bone, therefore from its size and structure it must have been part of the thigh bone of some gigantic bird which most certainly had never flown. From this fragment, Owen, now much interested in his discovery, proceeded to reconstruct the bird as he conceived it must have appeared during life. This reconstruction from so limited a premise of a bird, not fossil, though probably only recently extinct, from a country—New Zealand—where birds of such a size were entirely unknown, was received by the scientific world with the utmost incredulity. The Zoological Society at first refused to publish Owen's paper in their *Transactions*, and finally did so under protest, throwing all the responsibility on Owen himself.

In a few years' time Owen was completely justified, as not one only but several skeletons of this magnificent bird were sent to this country. One of these skeletons, 16 ft. high, was placed in the museum of the Royal College of Surgeons, in Lincoln's Inn Fields, and for long there lay at its feet the piece of bone from which Owen had reconstructed the bird, and along with it the original sketch of what he supposed the bird would look like, which bore a most remarkable resemblance to the actual skeleton. This dinornis—terrible bird—as it has been called, or moa, as the natives call it, is not a fossil, and has probably only recently become extinct. It may interest you to know that many have identified it with the roc, that great bird which rescued Sindbad the Sailor from the enchanted valley, for Sindbad was a true man, and not merely the creation of a vivid imagination, as we learn from many unconscious touches in his travels. For example, Sindbad tells us that he sailed so far south that he saw the sun rise upon his right hand; the Phœnicians said the same thing when they returned bringing Solomon his gold, apes, and peacocks; but Herodotus, the great traveller and historian, who did not always stick scrupulously to the truth himself, simply says, "I don't believe them;" while even in the present day, as I know from personal inquiry, there are many who fail to recognise the truthfulness of this fact.

But it is in connection with medicine, and specially perhaps with surgery, that the method of Zadig has obtained its greatest triumphs in modern times. Such, however, is the fallibility of the human intellect, that even although we employ right methods of interrogating nature, truth is only gradually expiscated by slow degrees and at the expense of many blunders. We have not yet attained, nor are we ever likely to attain, to absolute truth in relation to the medical art. But though our knowledge never rises to certainty, it does not therefore follow that we may never depend upon such knowledge as we have. Knowledge that is absolute certainty was not made for man, but man is so constituted as to do very well without it. Especially is this the case in regard to the medical art. Notwithstanding the divers views of medical practitioners in different ages, and their varying methods of treating disease, the medical art has always been sufficient for the needs of mankind, otherwise the race would long since have disappeared from this sublunary sphere. The sick, no doubt, are sometimes cured without a physician, but not therefore without physic. They have done certain things, they have avoided others; if they have regulated themselves by certain rules, these rules have been those of art; if they have blindly trusted themselves to chance, it has only been in so far as they have by chance approximated to the procedure of good medicine that they have been rescued from danger.

I make these remarks *à propos* of the great and remarkable change that has come over the practice of medicine within the last fifty years. Up to quite close upon the middle of this century, blood-letting was the chief remedy for all diseases, but chiefly for all inflammatory diseases, and so great was the belief in its efficacy, that a well-known physician of those days—Dr. Radcliffe—at the age of 60, submitted to the detraction of 100 oz. —5 pints—of blood from his arm, because, though he considered the remedy not safe, he thought it not so dangerous as the disease. Yet this method of treatment, now so completely exploded that hardly anyone now alive has ever seen it practised, was also founded on the method of Zadig, centuries before Zadig was created.

But there is a right and a wrong method of arguing, even from Zadig's premises. I have already mentioned that Cuvier made a narrow escape of coming to sad grief over his argument, that an opossum's skull was sure to be accompanied by marsupial bones, because in this prediction he followed the analogy of a pretty widespread zoological law, but one which has by no means the force of a physiological law. So our forefathers erred in arguing, from the relief that followed blood-letting, that this was a curative agent, and did not recognise that the relief obtained had no influence on the course of the disease, and was indeed little more than a mere coincidence. Yet so prone is mankind to be impressed by whatever exhibits the semblance of power, that one of the ablest physicians of the day, when he first heard that inflammations could be successfully treated without blood-letting, declared that "whoever could persuade him of the truth of this, would also produce in his mind a general distrust of medical evidence in all cases of every description." Yet the medical profession is probably even more flourishing than ever, and none of us carries a lancet case. For a time, however, the overturning of the old beliefs was followed by a period of comparative chaos in the profession, and this has been followed by the promulgation of an entirely new system of pathology and of perfectly novel methods of treatment, which promise to have a most unheard of influence on the life-history of mankind, not only as regards the cure of their diseases, but still more as regards their prevention.

In these discoveries, based on the life-history of microscopic organisms unknown up to yesterday, the method of Zadig has played no unimportant part. You will not be surprised when I name to you the great Frenchman Pasteur as practically the founder of this new pathology, or when I state that his success has not been based on any vague intuitions, but on legitimate deductions from observations made by himself, while every step has been proved by careful experiment before it has been accepted as truth. As the late Professor Tyndall has said, "The days when angels whispered into the hearkening human ear secrets which had no root in man's previous knowledge or experience, are gone for ever. The only revelation—and it surely deserves the name—now open to the wise, arises from 'intending the mind' on acquired knowledge."

The great characteristic of Pasteur's mind was to take nothing for granted, and with the absolute faith that every effect must have a pre-existent and adequate cause, and that similar effects must have similar causes, the line of research was in no case difficult to define. Pasteur's name is indissolubly connected with the life-history of organisms belonging to the world of the infinitely little; not one of these organisms was discovered by him, but by careful and accurate experiment he was able to connect the development of these organisms with many interesting and important phenomena. From the time of the invention of the microscope, those multitudinous organisms that then swarmed into the field of vision, and had been hitherto unseen and unknown, had become objects of engrossing interest and inquiry to all observers. Hence, as we may readily imagine, the various organisms whose life-history subsequently became, in the hands of Pasteur, of so much importance to the prosperity of nations and the health of their peoples, were most of them, at all events, as mere organisms, well enough known before his day. Nay, it is even surprising how near the philosophic mind had got to the truth many long years previously. Thus, in the middle of the seventeenth century, the great physicist—Robert Boyle—made the remark that "he that thoroughly understands the nature of ferments and of fermentation, shall probably be much better able than he who ignores them, to give a fair account of certain diseases (as well fevers as others), which will perhaps be never properly understood without an insight into the doctrine of fermentation." This, which sounds like an absolute prophecy, is merely an example of Aristotle's εὐστοχία, or happy guessing, by which, as the word signifies, he wished to express the way in which an archer hit his mark without being able to explain either why or how, and bears about the same relation to the careful induction of modern investigators that this same lucky guessing bears to the various mathematical and scientific calculations necessary to ensure success with our modern arms of precision.

I doubt if any great discovery was ever made suddenly, certainly Pasteur's were not; but the student of that time, while wondering at the many happy guesses that so closely approached the heart of the matter, has no difficulty in saying exactly where the master-mind stepped in, and by fitting the key to the lock has opened the door for the entrance of truth. The key and the lock, so to speak, were both there, and many had been fumbling with them, but none could fit them together till the genius arose who did it so easily that no one or scarcely anyone gave him credit for the ability and skill which enabled him to do it.

So late as 1875, one of our own ablest pathologists, in speaking of Cohen's recent discovery of the *Dauersporen*—lasting or permanent spores—adds: "I have referred to these here in order to show how completely the biography of a schizomyces—a bacterium—represents all the phases of the process of contagion." This statement is made in the course of some remarks on the etiology of splenic fever, in a report on the pathology of the infective processes, and just before the publication of Pasteur's remarkable discoveries in regard to this disease. When Pasteur was appointed Dean of the Faculty of Science at the University of Lille, a town whose staple industry consisted in the products of alcoholic fermentation, he devoted a large part of his lectures to the study of fermentation, in order that he might be of some definite use to his students. In the course of the studies necessary to prepare these lectures, Pasteur not only became convinced of the truth of Cagniard-Latour's ideas—for they were nothing more—but he did not stop there, he saw that behind this most interesting phenomenon of alcoholic fermentation there must lie some great general law. The master-mind was stretching out his hand for the key which as yet he only dimly recognised. What seemed to strike him most forcibly was, that as all that has lived must die, so all that is dead must be disintegrated, dissolved, or gasified, so that the elements which are the substratum of life might enter into new cycles of life, otherwise the earth would be encumbered with the dead matter of organised beings, and the very perpetuity of life would be compromised by gradual exhaustion of its materials. His ideas have been very aptly paraphrased by the poet in these words:—

"All changes, nought is lost; the forms are changed,
And that which has been is not what it was,
Yet that which has been is."

Over this vast work there presides one grand phenomenon—fermentation, putrefaction, slow combustion—call it what you will, and it receives one or other of these names according to the conditions in which it is manifested. All these are merely terms applied to movements that occur in matter that has ceased to live, without any intervention on the part of man. The key to the situation lay in the discovery of the cause of these various processes. Up to the time when Pasteur engaged in this investigation, many attempts had been made to explain the mystery, but the time was not yet ripe, the master-mind had not arrived. The prevalent theory was a very ancient one, to which Liebig had given the support of his great name. "Ferments," said Liebig, "are all nitrogenous substances—albumin, fibrin, casein; or the liquids which embrace them—milk, blood, urine—in a state of alteration which they undergo in contact with the air." According to this idea, the oxygen of the air was the prime cause of the molecular disintegration of the nitrogenous substance, and as it was broken up it caused molecular motions which were gradually communicated from particle to particle in the interior of the fermentable matter. This theory seemed to find great support from an experiment made by Gay-Lussac in the beginning of this century. In examining Appert's process for the preservation of animal and vegetable substances, which consisted in enclosing these substances in hermetically sealed vessels, and subsequently heating them to a sufficiently high temperature, Gay-Lussac found that grape-must, which had been thus preserved without change for a whole year, immediately began to ferment on being merely poured from one vessel into another, that is, on being brought into momentary contact with the air. There seemed no reason to doubt that the oxygen of the air was the actual cause of the fermentation, though after all this was a mere surmise without proof. Like the recovery from inflammation after blood-letting, a certain result followed a certain action, but the elements involved were not simple; it was safe to say that fermentation followed the pouring of the must from one vessel to another, but it was a mere assumption to credit the oxygen of the air as being the cause of this fermentation. This was not following the method of Zadig at all, it was mere guessing; and in this case, as we shall see, not even lucky guessing. Other chemists had an entirely different idea as to the cause of fermentation, they regarded it as a phenomenon of contact. The albuminoid body that acted as the ferment was supposed to be endowed with what was called a catalytic force; it added nothing to the fermentable matter, and it took nothing from it; it was supposed to act in some mysterious manner by contact alone. The word catalysis still survives in the vocabulary of some, who regard it as sufficiently explanatory of the fact that the breaking up of fermentable matter is sometimes out of all proportion to the needs of the organism concerned. But though there is a certain pleasure in rolling out those grand old words, catalysis and eremacausis, the pleasure is mainly archæological; they remind us of the chaotic ignorance that prevailed up to and beyond the middle of this century, and so far as they are still in use they indicate how incomplete our knowledge still is.

A German philosopher, Schwann, completely disproved the action of oxygen in the causation of fermentation, or at least of putrefaction, one of its forms. He placed decoctions of meat in flasks sterilised by heat, and supplied them with calcined air only, the power of which to support life was quite unimpaired. Putrefaction did not set in, and Schwann concluded that putrefaction was not due to air, but to something suspended in the air which heat was able to destroy. He went no further, and what this something might be was not even suspected.

About this time, Cagniard-Latour discovered the yeast plant; he found the key that was to open the door for the advent of truth, but he knew not how to use it. It is true that for a time Cagniard-Latour did consider whether there might not be some causal connection between the torula he had discovered and the fermentation of the sweet wort itself. But, as in other fermentations, the existence of an organism had not been discovered, even on the most careful research, the idea of any possible connection between the development of the torula and its action as a ferment was reluctantly given up.

Just at this time Pasteur was engaged in investigating the production of lactic acid. This was made by adding some fibrin —as a catalytic ferment—to a solution of sugar containing a little chalk to absorb the acid when formed. While watching this process, Pasteur noticed that, as it proceeded, a grey deposit was formed, and that this increased in quantity as the process continued. He examined this grey deposit, and found it to consist of innumerable minute particles, analogous to tiny microscopic fungi, and with his usual acumen concluded that possibly this might be the actual ferment, the analogue of the torula in the sweet wort. Instead of the decomposing animal matter supplying a fermentative influence which broke up the sugar into lactic acid, as was supposed, he at once inferred that all that the fibrin supplied was merely certain chemical ingredients necessary for the growth of these organisms. He followed Zadig's method in a strictly logical manner, and to assure himself of the absolute correctness of his reasoning he put it to the test of practical experiment. To the solution of sugar with a little chalk he added, not albumin, but certain mineral salts, along with a trace of the grey deposit. The result of this crucial experiment was a most signal success, there was an unusually brisk lactic fermentation. The master-mind had at last arrived, the key was fitted to the lock, and opened it so readily that the wonder was it had not been sooner done. By a series of brilliant investigations, Pasteur succeeded in showing that all true fermentations, including putrefaction, were the result, not of catalytic contact, nor of the chemical action of oxygen, but of the growth of micro-organisms within the fermenting matter; and the next question that presented itself for his consideration was the source of these organisms. Did they arise *de novo* by spontaneous generation, or were the germs always present in the circumambient air, only waiting the advent of a fitting soil for their propagation and growth? The so-called heterogonists held to the one opinion, Pasteur and the vitalists held to the other. The controversy was long and bitter, but by a series of most careful and elaborate experiments, too lengthy to enter upon now, Pasteur succeeded in showing that with perfectly pure air neither fermentation nor putrefaction was possible; there is no such thing as spontaneous generation of germs; and without the aid of those germs which he found everywhere present in the air, in greater or less number, none of these processes could occur—a fact, as we shall afterwards see, of paramount importance in relation to surgery. Pasteur was a physicist, and no biologist, yet he was perforce compelled to investigate many vital problems, and the results he arrived at have had and are still having a most important bearing upon the prosperity of nations and the well-being of their peoples. His discoveries in the various diseases which affect the manufacture of beer and of wine, as well as those that destroyed the silkworms and ruined the silk industry of France, were sufficient to restore prosperity to these arts, and to enable France to pay without difficulty to Germany the war indemnity of six milliards of francs. Presently, Pasteur's attention was turned to other organisms affecting animals of a higher grade in the scale of life.

In 1850, two Frenchmen, Davaine and Rayer, discovered little microscopic rods in the blood of animals that had died of splenic fever. Unconscious of the importance of their observation, they allowed the matter to drop for thirteen years.

In 1863, Davaine's attention was again directed to the subject by the researches of Pasteur, and he then pronounced the parasite to be the cause of the splenic fever. This idea was opposed by many of Davaine's fellow-countrymen, long discussions followed, and a second period of thirteen years elapsed before Pasteur took up the question.

Meanwhile, Koch, whose name is almost as much of a household word as that of Pasteur, had investigated the subject of the contagium of splenic fever, and with admirable skill and patience had followed up the life-history of the *Bacillus anthracis*, clearing up all the difficulties that surrounded it, and proving most satisfactorily that this bacillus was the true *contagium vivum* of the fever. Koch also showed that, while mice and guinea-pigs were invariably killed by the parasite, birds were able to defy it. This was a puzzle such as Pasteur delighted to solve, and his manner of doing so strikingly illustrates the character of his genius. The question he put to himself was, why should birds enjoy the immunity established by the experiments of Koch? And here is the solution of this problem and the manner he arrived at it. Pasteur knew that the temperature which inhibits the multiplication of the *B. anthracis* in infusions is 111° F., the temperature of the blood of a fowl is from 105° F. to 107° F.; it therefore closely approaches the prohibitory temperature, and if we add the vital resistance of the blood globules of a living fowl to any destructive agency, Pasteur considered that the conditions were sufficient to place the fowl beyond the power of the parasite. But, he argued, if the temperature of the fowl were reduced, parasite and fowl might meet on more equal terms, and the result might be different. This question could only be solved by experiment, and he proceeded to do so. By placing its feet in cold water, Pasteur lowered the temperature of a fowl to 98° F. or 100° F.; he then inoculated the fowl, thus chilled, with the bacillus of splenic fever, and in twenty-four hours it was dead. Pasteur then clinched this experiment by again inoculating a chilled fowl, permitting the fever to come to a head, and then by wrapping it in cotton-wool, and placing it in such circumstances as to raise its temperature, he had the satisfaction of finding it restored in a few hours to health. Pasteur also made an experiment with mice and guinea-pigs exactly the converse of this, for by raising their temperature after inoculation he enabled them to resist the bacillus and throw off the disease. The acuteness of the reasoning here is only equalled by the conclusiveness of the experiments, which are also full of suggestiveness for the treatment of fevers in man. By a remarkable series of experiments, chiefly made with fowl cholera, another microbic disease, but which were also made with splenic fever, Pasteur discovered that by lengthened exposure to the air, or in certain cases by transmission through a succession of animals, the living contagium became weakened and incapable of producing a virulent or fatal disease. But, along with this, he also found that animals recovered from the sickness caused by inoculation with this weakened virus were surely protected against the virus in its most concentrated form. They were, as the phrase now goes, immunised. Thus, by a strict adherence to the method of Zadig, Pasteur was able to show that all forms of fermentation, including putrefaction, are the result of the growth of micro-organisms; that many virulent diseases are also caused in a like manner; and, further, that by inoculation with an attenuated virus, animals and man himself can be efficiently protected against any attempt to infect them, even by inoculation with the more virulent disease. Thus, by his transcendent genius, his acute reasoning, and his accurate and conclusive experiments, Pasteur laid the foundation of the germ theory of disease, of curative antitoxins, and of immunising vaccines; and the incalculable benefit bestowed upon mankind by these remarkable discoveries is daily being increased and rendered more available, not only for the cure of disease, but also for the preservation of health.

To Lord Lister is due the credit of having been the first to grasp the importance of Pasteur's views, especially in relation to surgery. What seemed to have attracted Lister's attention to Pasteur's experiments was the remarkable difference in the healing of fractures, according to the condition of the skin. So long as the skin remained unbroken, however comminuted a fracture might be, and however much injured the soft parts might be, it was still possible to treat it as a simple fracture, and recovery went on as usual. But whenever the skin was broken, even though the injury might be comparatively slight, yet the danger to the patient was very much increased. Indeed, so much was this the case, that Mr. Syme, probably one of the safest surgeons that ever lived, used to say that in all hospital cases of compound fracture—as those fractures complicated with a wound through the skin are called—it was probably safer to amputate at once, and make no attempt to save the limb; and so great were the ravages of hospital gangrene in such cases, that in one of the largest and best-officered hospitals in Europe, the deaths from that cause alone amounted to 80 per cent.,—a frightful mortality, which was entirely arrested by the adoption of the antiseptic system of treating them. A simple clean incision, when its edges are brought together and kept so, heals by the first intention, as it is called, and in four or five days the only trace remaining is a thin red line. But should the wound get poisoned, as we say, the edges gape, and there is a foul-smelling discharge, the wound subsequently healing by granulation, by what we call the second intention. This is pretty much what used invariably to happen in the case of a compound fracture; the wound inflamed, the contained blood putrefied, and an evil-smelling discharge was poured forth. This was endeavoured to be prevented or mitigated by perfect cleanliness and the use of deodorants, but in vain; too often, indeed, ulceration or gangrene set in, and a fatal issue was not long delayed. So long as Liebig's views as to the action of oxygen in promoting putrefaction prevailed, it was hopeless to attempt to remedy this state of matters, as, under the influence of Graham's law of osmosis, oxygen was bound to reach the wound through the more or less porous dressings. With the advent of Pasteur's ideas, as to the necessary part played by living germs, the whole aspect of the subject was altered, and hope once more revived. It was vain to attempt to keep a wound so tightly shut up as to prevent the access of air and its oxygen, but it was perfectly feasible so to wash or filter the air as to deprive it of the microscopic germs that floated through it; or, still better, it was possible to dress the wound with some lotion that would either destroy these organisms or deprive them of their virulence. Lister employed both methods, and to him alone belongs the credit of inventing antiseptic lotions and dressings, though others have aided in bringing them to the perfection in which we now have them. Through good report and ill report Lister steadily pursued his way, seeking only the good of his patients; and the benefits he has conferred upon surgery can only be appreciated by those who remember what a large surgical hospital was thirty years ago. Twenty years previously, Sir James Simpson had conferred upon suffering humanity the priceless boon of chloroform, so that an operating theatre became a perfect elysium instead of the pandemonium it had formerly been. I am neither going to compare the two men nor their discoveries, but desire only to emphasise the blessings we who live in the latter half of the nineteenth century owe to these two distinguished men. Thirty years ago carbolic acid was little more than a chemical curiosity. Lister knew that it had been used to deodorise sewage, presumably by checking putrefaction; it had also been recommended to him by a chemical colleague, as likely to answer the end he had in view. Lister applied the undiluted acid to a compound fracture, and had the inexpressible satisfaction of seeing it proceed tranquilly to heal in the same peaceful manner as a simple fracture. This was a triumph indeed, and a blessed revelation for both surgeon and patient. Moreover, beneath the antiseptic layer, Lister had the opportunity of observing the whole process of healing in a lacerated and contused wound, large portions of which would, under ordinary circumstances, have died and sloughed off, leaving a large putrid sore, even if it led to no more untoward result. Lister found that under antiseptic protection the injured parts progressed, exactly as they would have done if the skin had remained unbroken; they were not thrown off as dead and useless, they caused no disturbance to the system, but were quietly absorbed. This fact led Lister to another discovery, for, by the use of aseptic animal ligatures to tie the arteries, he was able to close an operation wound at once and so allow it to heal by the first intention. The ligatures produced no irritation, but in due time were quietly absorbed. Undiluted carbolic acid acts as a caustic when applied to animal tissues; it caused therefore some slight destruction of the parts, but this was of little consequence compared with the tremendous danger that had to be averted; it made it, however, unsuitable as a dressing for recent operation wounds; but, by diluting the acid with water, it was deprived of its caustic properties, and, being held by the water with but little tenacity, it was free to act energetically on those substances for which it had a greater affinity, and was quite capable of preventing the access of any living microbes to the wound. Such, then, was the commencement of antiseptic surgery; you all know the perfection to which it has now attained, and many, I daresay, well remember the various steps by which that perfection has been attained. Lister's putty and his spray are things of the past, which served good purpose till more exact knowledge and a larger experience taught us better if less elaborate methods.

Thus, by strictly following the method of Zadig, and reasoning from the known microbic origin of other forms of fermentation to the probable cause of that form he was most concerned about, and by following Pasteur's example and carefully and judiciously experimenting, by preventing the access of all microbes to the wounds under treatment, Lister was able entirely to prevent those untoward accidents that had formerly proved so fatal; to banish septicæmia, pyæmia, and hospital gangrene from our wards; and to inaugurate an entirely new era in surgery. Pasteur was a man so accurate and careful that he was always safe to follow. When some one proposed, scientifically, to "strangle" Pasteur, "Take care!" said one of his most eminent confrères in the Academy of Sciences,—"take care! Pasteur is never mistaken." Upon another occasion, some posthumous papers of Claude Bernard, purporting to describe a new method of spontaneously generating the substance which causes the fermentation of the must of the grape, were brought before the Academy of Sciences. Pasteur's reply was: "I shall start for the Jura. In the middle of my vineyard, which is 10 metres square, I will cover over some stocks with an improvised frame. These stocks will go on living and bearing grapes, which will ripen. It is now July. At this time of year, as I have already declared, the germs of the cellules which form the ferment of the grape in the vats do not yet exist, either on the green grapes, on the bunches, or on the vine leaves; I will envelop the bunches of the stocks that are underneath the frame with a layer of cotton-wool that has been raised to a temperature of 150°C. = 302°F. This done, I shall return to Paris with the key of the frame in my pocket, not returning to the Jura until the vintage season, at the beginning of October. I predict to the Academy, that the grapes wrapped in cotton-wool under the frame, and which will then be quite ripe, may be crushed in the open air, and that the juice coming from them will be incapable of fermentation." This prediction was fulfilled. In October, Pasteur returned to the Jura, cut off several stocks laden with ripe grapes, and brought them carefully to Paris. He laid them intact on the table of the Academy of Sciences, and challenged the editor of Bernard's pamphlet, and any of his colleagues who chose, to cut off as many bunches as they pleased. "Only crush them in contact with pure air," said he, "and I defy you to produce fermentation." No! Pasteur was never mistaken, and he had always the courage of his opinions, as well as the skill to prove them right. I have already pointed out that Pasteur discovered, that by successive cultivations the microbes of fowl cholera, as well as that of splenic fever, could be so attenuated as to be capable of being employed as a vaccine—as, in honour of our great compatriot Jenner, he called its prophylactic use—against the more virulent disease. That is, he found that animals inoculated with this attenuated virus passed through a mild attack of the disease, and were thereafter proof against its more virulent form, even though inoculated with virus of full strength; just as Jenner found that those vaccinated were proof against smallpox, even when inoculated with its virus. It is true that probably no form of vaccination renders any animal proof against the more virulent disease for all time, just as we know that in course of years we may have secondary attacks of measles, or scarlet fever, while even a smart attack of smallpox does not always prevent the occurrence of a second or even a third attack in the same individual.

Pasteur also discovered that a weakened poison might have all its pristine virulence restored, either artificially or by the action of natural causes. He found, for example, that a poison too weak to destroy an adult animal, might yet be strong enough to kill a very young one; and he also found that virus from this young animal, so destroyed, would be powerful enough to kill one a little older and more robust. Thus, by successive infections, a weakened poison could be artificially restored to all its original virulence. Like all Pasteur's discoveries, this fact has an important practical bearing; we learn from it how it is that a mild type of any of our infectious diseases may suddenly assume a most virulent aspect, and that this sudden change to malignancy may be due to some constitutional peculiarity in the recipient, and not to anything remarkable in the infection or in the original victim.

Moreover, Pasteur also made another most important discovery, namely, that a virus may lose all its virulence by exposure to the air. Hermetically sealed, this virulence may be preserved unimpaired for months or years, but exposure to the atmosphere gradually weakens the virus, until in time it becomes virtually inert. Again, by some occult change in the atmosphere, or some unknown alteration in its electric tension, the virus may recover its properties and be restored to all its original virulence. This *occulta aeris diathesis*, and *inexplicabilis temporum ratio*, as Sydenham calls it, and its influence upon epidemic diseases, was very well known to the ancients in a confused sort of way. Indeed, in our own times, we have had several very remarkable instances of it. The first that occurs to me is relapsing fever, at the present moment happily unknown. This fever was not recognised and separated from other fevers till the end of last century; since that time we have had several severe epidemics of it with long intervals, during which not a single case was known to occur. One of its synonyms is famine fever, and it has generally been found to originate in some part or another where famine prevailed, and, acquiring virulence as it spread, its ravages were not limited to the destitute and poverty-stricken, but extended into all classes of society. The debility induced by insufficient food evidently weakened the powers of the organism to resist the microbe—in this case a spirillum—which underwent its normal development, gaining strength with each successive infection, and accompanied by its very peculiar type of fever.

Concerning this peculiar type I have heard the late Professor Christison tell an amusing story. His colleague, Dr. Bennett, had been laid aside by an attack of fever for about a fortnight. In talking over his illness, Christison said to him, "I feel sure you have had an attack of my old friend synocha," as relapsing fever was then called, which had not been seen for fourteen years, 1828–1842; "and in that case," he said, "you are not out of the wood, for at the end of a week's apparent convalescence you will have a second attack of fever."

"In that case," said Bennett, "your friend has not much time to lose, as it just wants three hours to the end of the week."

Christison left him, and had barely reached his own home—about a mile away—when a messenger arrived to say that he had been quite right, the fever had returned.

In typhus fever we have another most remarkable example of a disease which has almost ceased to exist. We hear of a case or two now and again, but it has practically disappeared from our midst, and I am sure there are many physicians of the present day who have never seen a case of typhus, and who would probably have no small difficulty in recognising the disease. And yet, but fifty years ago, it was a perfect scourge to humanity; the last great epidemic began in 1846, ended in 1848, and was at its height in 1847. In 1847, 19,254, or one in every nine of the population, suffered from it in Edinburgh alone, and of these 2503 died. Every available space in and around the Royal Infirmary was filled with fever cases, and about fifty a day had to be sent back to their own homes for want of accommodation. In those days so great was the mortality from fever among students and young medical men, that it would have been safer for them to have been on the field of Waterloo than to enter the wards of the Infirmary. The mere money cost to the country of such wide-spread epidemics was very great, not only for the provision of hospital accommodation, medical attendance, and nursing, but also for the care of the many widows and orphans of the unfortunate victims. Moreover, in 1847, Government spent £150,000 on quarantine hospitals, to avert the spread of typhus to America, with but partial success. We may be thankful, indeed, that so fatal and so costly a disease has now practically ceased to exist. With the advent of the poor laws, typhus began to wane, and the great Manchester cotton famine, which inaugurated more systematic attention to the poor, and to the prevention of destitution, seems to have rung its tocsin; but we must never forget that its microbe—whatever it may be, for it has not yet been discovered—is with us still, and at any time may break forth with renewed virulence.

From Pasteur's researches we have learned that though this revival of virulence in a microbe may, and sometimes does, arise from atmospheric causes alone, it comes about more certainly and probably more frequently from the microbe gaining a footing in some weakly individual, and acquiring greater energy and virulence through development in a congenial soil. Hence, to quote the words of one of our most eloquent writers, we must ever remember "that no human effort should be spared to put under foot this great enemy of man, for this is a matter in which each of us has a personal interest. The duty itself we may evade, but we can never be sure of evading the penalties of its neglect." "The members of the great human family are, in fact, bound together by a thousand secret ties, of whose existence the world in general little dreams. And he that was never yet connected with his poorer neighbour, by deeds of charity or love, may one day find, when it is too late, that he is connected with him by a bond which may bring them both, at once, to a common grave."

Plague is a third epidemic disease which has for so long disappeared from the ken of the British physician, that the mere mention of the name is apt to carry us back to our school days and to the plague of Athens before the Christian era, or at least we may think of Defoe's "History of the Great Plague of London;" or, if poetical, we may call to mind the tragic history of Bessie Bell and Mary Gray, forgetting all the while that in the first half of this century the Mediterranean and the Black Sea were studded with quarantine stations, from Gibraltar to Odessa on the one hand, and from Malta to Trebizonde on the other, all to keep the plague within what were almost looked upon as its normal limits. The four great plague centres in those days were Trebizonde, Constantinople, Smyrna, and Egypt, and each centre had its own particular season during which plague ravaged the district, and was regarded as highly contagious. But no sooner was this season past than the inhabitants ceased to fear the disease, and were not even careful to avoid the sick, affording a most remarkable illustration of Pasteur's observation regarding atmospheric influence upon microbic disease. The inhabitants of those parts had a different explanation. They looked upon plague as forced upon them by a set of evil genii, who were resisted and ultimately discomfited by the good genii of the place, who drove them forth; as the evil genii fled they were pursued by all the dogs in the town. Strange to say, when this happened the epidemic ceased, no fresh cases occurred. In quite recent times famine and destitution, by weakening the constitutions of our Eastern fellow-subjects, have permitted the plague microbes once more to gain a congenial soil; and, in accordance with Pasteur's discovery, they have spread from weakened organisms to stronger organisms, gaining force and virulence with each advance, till now Europe and its highly civilised nations are threatened with an outbreak of plague as virulent and fatal as any that ever occurred in the dark ages.

But, it may be asked, has modern civilisation—modern medicine—no greater resources than our forefathers, whereby this great disaster might be averted? Yes, indeed, thanks to Pasteur, we have resources sufficient for our needs. Our Eastern fellow-subjects are too timorous and too ignorant to reap the full benefit of the prophylactic and curative measures, not merely placed at their disposal, but actually forced upon them with all that natural anxiety born of a desire to defend ourselves; nevertheless, we have been able considerably to restrict the spread of the disease and to modify its mortality. So far as we can learn, our Portuguese neighbours have been attempting to ignore the presence of plague among them, rather than girding their loins for any vigorous attempt at self-defence. But the French are acting with all that wisdom and foresight to be expected of the fellow-countrymen of Pasteur. When a vessel arrives, having cleared from a plague port, the crew and passengers are first taken in hand and cared for, according to their needs; but, before the vessel is permitted to come near the land, measures are taken to destroy all the rats and mice on board. Rats and mice have long been recognised as most active agents in spreading infectious diseases, both among men and animals; the nomadic habits of these creatures has rendered impossible any attempt to prevent this, but on board ship the case is different. Even on board ship, however, traps and poison may be avoided, and are not suitable, where it is imperative to destroy all the rats and mice on board any vessel, lest one bearer of the plague germ might escape, not only to carry death amongst its own congeners, but to spread a deadly disease amongst the inhabitants of that country to which it escaped. Hence the plan adopted has been to communicate to them a fatal epidemic from which none can escape. You may remember that some years ago a plague of mice in Thessaly, which threatened to destroy all the pasture, was effectually treated in this manner, and a similar treatment was recommended for a similar plague of mice in the south of Scotland; but, if I remember rightly, the natural foes of mice, hawks and owls, whose numbers were for the time abnormally increased, were trusted to, and did their duty effectually. All epidemic and epizootic diseases are liable to be spread by the agency of rats and mice, which, of course, are neither amenable to quarantine laws nor to medical treatment, and can only be destroyed. With all the resources of the Pasteur Institute at its command, we may be certain that every endeavour will be made to prevent the entrance of plague into France, either by man or beast; and if plague ever gains a footing in that country, it will not have arrived by its own seaboard, but by its landward frontiers, where the same vigilance, especially as regards the smaller living germ-bearers, cannot possibly be exercised.

We see thus how great an advance has been made in our knowledge of disease, under the influence of Zadig and the guidance of Pasteur. Notwithstanding all the difficulties inherent in the subject, and the powerful opposition of many well-meaning but mistaken men, we have, within the limits of one generation, passed from a knowledge which could only be called dark and chaotic, into one where light and order prevails. We have all but banished from our surgery hospital gangrene, septicæmia, and pyæmia, the great scourges of the last generation. By appropriate vaccines we can not only protect ourselves against smallpox, but also against plague, typhoid fever, and other fatal disorders; while those from which we cannot be so surely protected can yet be so efficiently treated that the mortality of even so fatal a disease as diphtheria has been enormously reduced. If we put a drop of blood between two pieces of glass, and examine it with a microscope, we observe that it consists of a fluid containing two kinds of globules; of these, the more numerous are of a reddish colour, and the less numerous are white. If the blood be kept at the temperature of the body, these white globules, which were so recently coursing harmlessly through our blood vessels, are observed to present certain remarkable phenomena of independent vitality; they alter in shape, and shoot out processes now in one direction and now in another; they migrate through the pores of the tissues, and are capable of enclosing and digesting certain foreign organisms which get into the blood, notably microbes, which might otherwise have given rise to disease. This was first observed by a Russian naturalist, Metchnikoff, who gave to these white globules the name of "phagocytes," or "devouring cells," and urged with great vigour the view that the defence of the body from microbic disease was due to this action of these wandering cells. By and by, however, this morphological doctrine had to be given up, as it was found that perfectly cell-free blood was quite capable of destroying bacteria in some purely chemical way. It has also been found that the active substance, whatever it is, though it may neither destroy nor remove the bacteria from the blood, which may still be left to the phagocytes, is yet capable of neutralising the toxines or poisonous secretion of those micro-organisms upon which all their hurtful properties depends. This, I suppose, is the stage in which we now are. In robust health a man can withstand exposure to infections with an impunity that is lost so soon as his health is in any way broken. What Pasteur called "vital resistance" is due to this natural antitoxine, and you may remember that it was this vital resistance, coupled with the natural high temperature of their blood, that enabled fowls to resist the poisonous action of the microbes of splenic fever.

Microbes, like the poor, are always with us, within us and around us, but they do us no harm; because, when in good health our natural antitoxine is sufficient to neutralise the toxine with which they endeavour to flood our tissues; and one form of treatment—the Nordrach treatment of phthisis—is based upon this fact, as an attempt is made, by forced feeding and free exposure to the health-giving effects of sunlight and fresh air, so to increase the natural antitoxine as to enable it to overcome the toxine of the *B. tuberculosis*. It has long been known that insufficient nourishment, crowded and ill-ventilated rooms, and all depressing influences, are favourable to the development of tubercular disease, and most successful results have attended the removal of patients from such conditions into more healthy surroundings, often accompanied by other adjuvant treatment, to which the favourable result has been frequently attributed. The Nordrach system is an attempt to carry out this truly natural system of treatment in a more definite, if not more scientific, manner; and a knowledge of its mode of action and its necessary limitations may serve to prevent a not unnatural disappointment at its occasional failure.

We have come a long way from the queen's lady-dog and the king's galloper of Zadig, but we have seen that it has been by a strict following of his method, by a careful search for that efficient cause which must always precede every effect, that medicine has now attained its most romantic and yet its most scientific development. We see before us a vista of possibilities undreamt of fifty years ago. Possibilities of the cure of diseases, which still claim myriads of victims annually, in a manner so simple, so rapid, and so effectual as to be simply marvellous and well nigh incredible; possibilities of modifying, if not of altogether annihilating these diseases; and, still more remarkable, possibilities of protecting ourselves from these diseases by the employment of appropriate vaccines. We know how antiseptic surgery has grown and progressed; the progress of medicine has been slower, but not less remarkable. Some mistakes have doubtless been made, but the movement has always been onward. Many of us remember the blunders which were made, both as to the value and the teaching of auscultation, as well as of microscopy, the two great discoveries of the first half of this century; it cannot be but that similar blunders are being made now in regard to the marvellous discoveries of the last half of this century, at which I have done no more than hint. These are but a mere beginning, and, as Pasteur himself has said, "You will see how it will all grow by and by. Would that my time were longer!"

THE DIFFERENTIAL DIAGNOSIS OF GOUT, RHEUMATISM, AND RHEUMATOID ARTHRITIS.

By Arthur P. Luff, M.D., B.Sc., F.R.C.P., *Physician in charge of Out-Patients, St. Mary's Hospital, London.*

The differential diagnosis of these diseases is a very important matter, and it is all the more important to direct attention to such diagnosis, because undoubtedly in the past many cases of rheumatoid arthritis have escaped recognition, and have been diagnosed either as rheumatism or as gout. When it is considered that the treatment of these three diseases is quite different, the necessity of a correct diagnosis is manifest. I am of opinion that many cases which are diagnosed as chronic rheumatism of the joints are not chronic rheumatism at all; many of them are cases of rheumatoid arthritis, and a fair number are cases of gout. I believe chronic rheumatism of the joints—chronic arthritic rheumatism—to be a comparatively rare affection; at any rate it is not very frequently met with. Cases are frequently diagnosed as cases of chronic rheumatism, in which there are great deformities of the joints, lipping of the cartilages, osteophytic outgrowths, and grating of the ends of the bones. Those are cases of rheumatoid arthritis. In chronic rheumatism, neither lipping of the cartilages, nor the osteophytic outgrowths which are so diagnostic of rheumatoid arthritis, ever occur.

Rheumatism is a disorder which generally manifests itself as acute rheumatism or rheumatic fever; but in the chronic condition, although it generally manifests itself as an arthritic disorder, that is to say a disorder affecting the joints, it may not manifest itself that way at all; it may simply show itself by the production of chorea, or by the production of erythema, or by the production of fibrous nodules, or by the production of endocarditis or pericarditis. Therefore rheumatism is a disorder which does not necessarily show itself as a joint affection; it may become manifest in some other way. In other words, there is the articular chronic rheumatism, and there is the abarticular chronic rheumatism—such as the choreic and erythematous forms. As an assistance in the diagnosis of a chronic articular affection, there is a rough but fairly sure test which is frequently of assistance in diagnosis—it is treatment with salicylate of soda. If the case responds well to this treatment, it is a case of rheumatism. If it does not respond to this treatment, the existence of rheumatoid arthritis or gout is fairly certain, as neither of these affections respond well to salicylates. When I hear the remark about "an obstinate case of rheumatism which has not done well with salicylates," I feel fairly sure that it is a case of gout or of rheumatoid arthritis—more probably the latter.

Rheumatism in its subacute or chronic forms certainly may affect the joints, but it never produces that permanent deformity which the other affections may, especially the lipping of the cartilages and the bony outgrowths already referred to. As regards the actual diagnosis of rheumatism, it is usually fairly easy. If a patient complains of pains in the joints, which pain flies about from joint to joint, and generally affects some of the muscles at the same time, and if, in connection with these flying pains, there are indications of the presence of the rheumatic erythema—erythema nodosum—then the diagnosis of rheumatism is obvious. As a rule, the fitful way in which the joints are affected, the fairly rapid subsidence of the swellings of the joints, and the association of muscular pains, make the diagnosis a simple matter. Then the response of the disease to treatment by salicylates will settle the diagnosis.

As to the distinction between rheumatoid arthritis and gout, I think a mistake is more likely to be made, but it should be avoided if some patient observation is given to the case. By rheumatoid arthritis I mean the disease known as "arthritis deformans," or "polyarthritis deformans," or "rheumatic gout." I think that very often the unfortunate name of "rheumatic gout," as applied to rheumatoid arthritis, is a cause of the two conditions being confused. The following distinguishing characters show how very different the two diseases are. In the first place, rheumatoid arthritis occurs most commonly in females, gout occurs mostly in males. Rheumatoid arthritis occurs more commonly amongst the poor and ill-nourished; gout mostly among the well-to-do and well-nourished. Rheumatoid arthritis is a disease which is improved by good dieting; in the case of a gouty person a spare and plain diet is indicated. The onset of rheumatoid arthritis is insidious; that of gout sudden and obvious. As regards the commencement of the attack, gout most commonly begins in one of the feet, especially in the great toe joint; rheumatoid arthritis, although ultimately it frequently affects many joints of both hands, nearly always begins in one joint, most commonly selecting one of the joints of the thumb, either the carpo-metacarpal or metacarpo-phalangeal joint, after which it rapidly spreads to the other joints. Then, as regards the appearance. In the case of rheumatoid arthritis there is no obvious swelling at first, and no marked redness. In the case of gout, at its commencement there is very obvious swelling, marked redness, and a shiny condition of the skin around the affected joint.

In rheumatoid arthritis there is very little pain at first. There is some aching in the joint, but it starts in a very insidious manner. It is this insidious character of the disease which is one of its bad features, for the patients do not seek advice until the affection is fairly advanced. Gout, however, begins in the most marked manner with severe pain; the patient as a rule waking up in the early morning with excruciating pain in the great toe. Therefore, if there is doubt as to whether a particular case is one of rheumatoid arthritis or of gout, the patient should be questioned as to the commencement of the attack, in order to ascertain whether it began with an obvious outburst of pain, and with swelling and redness of the joint, or whether it began very insidiously. Then as to the joint affections. Apart from what has been stated as to gout generally beginning in the foot, and rheumatoid arthritis generally in the hand, there is one joint commonly affected in rheumatoid arthritis which is not affected in cases of gout, that is the temporo-maxillary articulation. I have never seen a case of gout in which the temporo-maxillary joint has been affected, whereas in rheumatoid arthritis it is extremely common for that joint to be affected. Another distinction is this, and it is perhaps one of the most important distinctions, namely, in connection with rheumatoid arthritis there is a remarkable symmetry in the affection of the smaller joints of the hands. In gout that symmetry is wanting. It was this symmetrical affection of the joints which led to the idea—which I believe to be absolutely erroneous—that rheumatoid arthritis is a nervous disease. Lastly, in a case of rheumatoid arthritis, sodium biurate is neither found in the joints nor in the blood, whereas in the gouty person sodium biurate exists both in the joints and in the blood.

As to the etiology of these three diseases. About rheumatism there is little to be said, for the simple reason that little is known as to the cause of rheumatism. Acute rheumatism is, in my opinion, undoubtedly an infectious disease, that is to say, a microbic disease, and in all probability the pains, both articular and muscular, are due to some toxic product which is produced by bacterial agency. What that product is, is not known. A micro-organism peculiar to acute rheumatism has not been isolated yet, but there are many facts which point to the infectious character of the disease; for instance, the way in which it occurs occasionally in outbreaks; the way in which in a certain house a number of the family will be seized with it; the suddenness with which people are attacked. I think all these facts point to the infectious nature of the disease. At one time it was believed that the pain was due to the development of uric acid in the system, and at another time it was believed to be due to lactic acid in the system. I do not believe either of those theories to be correct. I believe that some toxic product is generated, and it is possible that that toxic product is a fatty acid which is set free in the system, and which is responsible for the inflammatory affection of the joints and for the muscular pains. One reason for belief in this view is that sodium salicylate acts like magic in acute rheumatism, in removing pain and in getting rid of the disease. Now sodium salicylate is a body which can unite with fatty acids, such as glycocine, and eliminate them from the system as the sodium salicylurate.

As regards the causation of gout, there is no doubt about that. Gout is a disease which is due to an accumulation in the circulation of uric acid, in the form of the sodium quadriurate at first, and afterwards in the form of the biurate. The quadriurate is an unstable body, and changes into the biurate, which is at first present in the blood in solution, and later on becomes deposited in the joints. There are differences of opinion as to where that uric acid is produced, and as to whether uric acid is always present in the blood of healthy beings, or whether it is only present under pathological conditions, but there can be no difference of opinion as to the actual causation of gout.

When we come to the etiology of rheumatoid arthritis we are again on debatable ground, although the doubts existing as to the causation of this disease are rapidly being dispelled. I certainly hold the view, which I think is shared by many others, that rheumatoid arthritis is an infectious disease, and that it is due to micro-organisms settling in the joints. It was at one time believed to be of nervous origin, because of the symmetrical nature of its affection. That view, however, is at once upset, because it does not begin in a symmetrical way; it always begins in one joint on one side, and then spreads. If it were of nervous origin, one would expect all the joints to be affected at the same time. Why, if it is nervous in its origin, should it start in one joint and then spread to the others? But that is the very way in which an infective disease might spread. A second reason for supposing it to be of nervous origin was on account of the muscular atrophy which takes place when the larger joints are affected. This muscular wasting, however, goes on in every form of chronic arthritis, on account of disuse of muscles; there is no form of chronic joint disease in which there is no muscular wasting, and therefore it is not right to attribute to nervous causes this muscular wasting connected with rheumatoid arthritis any more than in connection with other joint diseases. Another fact which tells against the nervous theory is that, if this wasting were due to any central nervous affection, there would be present in the affected muscles the reaction of degeneration, which, however, is never obtainable in rheumatoid arthritis. This shows that the muscular atrophy is caused by disuse of the affected muscles. Another point against the nervous hypothesis is, that there is no nerve lesion to be discovered. Careful examinations have been made of the spinal cord in cases of rheumatoid arthritis, but no lesions or degenerations have been found. If the diseases were of nervous origin there would probably be some discoverable lesion in the cord. The view which, in my opinion, is probably the correct one, is that it is an infective disease, that it is due to a settlement of micro-organisms in the affected joints, that there they produce a toxine, and that that toxine, passing into the circulation, is responsible for any nervous symptoms which occur in the disease. Therefore the nervous symptoms are secondary to the settlement of the bacteria in the system. There are many reasons for believing this view to be correct. In the first place, rheumatoid arthritis is very frequently a sequela of some other infectious disease—that is to say, of some other disease which furnishes the opportunity for bacilli to gain access to the circulation. When it occurs in children, for instance, it is frequently secondary to scarlet fever, or rheumatic fever, or acute septic tonsillitis, all of which afford channels through which the micro-organisms can gain access to the circulation. In adults it is frequently secondary to some infective disease, which may be some ulcerative disease of the tonsils or of the gastro-intestinal tract, by which means lesions are produced through which the organisms can gain access to the circulation. Secondly, micro-organisms have been found post-mortem in the joints, both in the cartilages and in the fluids of the joints, and also when the fluid has been withdrawn by a hypodermic needle during life. They have been found in several cases by two observers in this country —Bannatyne and Wohlmann—who have produced cultivations of the organism. What they failed to do, and which would have been the final proof, was that when they inoculated these organisms into animals the disease was not produced in them. That failure was looked upon by many as a proof that rheumatoid arthritis was probably not an infective disease. That proof, however, has recently been obtained. von Dungern and Schneider, in Germany, have, from an undoubted case of rheumatoid arthritis, which after many years ended fatally, cultivated a diplococcus. Cultures of this diplococcus were injected into rabbits, and produced a similar articular disease to that from which the patient had suffered. That, if corroborated, will probably complete the proof that rheumatoid arthritis is an infective disease.

It is not common to get rheumatoid arthritis and gout associated in the same patient. What occasionally does occur is that gouty deposits may form in joints suffering from rheumatoid arthritis, but it is more in the nature of an accident than anything else. A person suffering from rheumatoid arthritis who indulges in rich living for a lengthened period of time, and especially if he takes much wine, may develop gout, and so gouty deposits in the joints of a patient suffering from rheumatoid arthritis may occasionally be met with. Still it is only a complication; there is no actual relationship between the two conditions, and one does not predispose to the other. Rheumatism certainly predisposes to rheumatoid arthritis, because a person who has been subject to rheumatism has the nutrition of the joints so much impaired for the time, that if there is any opportunity for the specific micro-organisms to gain access to those joints, it is very likely that they will there develop and flourish. That is why cases of rheumatism and rheumatoid arthritis certainly occasionally go together.

SOME OBSERVATIONS ON VASCULAR RESISTANCE.

By Harry Campbell, M.D., F.R.C.P., *Physician, North-West London Hospital.*

If there is one branch of physiology about which our knowledge is supposed to be more accurate and complete than another, it is that which treats of the circulation of the blood. Nevertheless, strange as it may seem, many erroneous views exist respecting it, even among expert physiologists. This is especially the case in regard to the subject of vascular resistance—one of paramount importance to the physician.

Vascular resistance may be considered from two standpoints—the physical and the physiological. I have elsewhere dealt with the subject from the physical standpoint,[1] and with regard to it shall here only summarise the conclusions there set forth. The chief object of this paper is to treat of vascular resistance from the physiological aspect.

Vascular Resistance Physically Considered.—*Capillary resistance.*—It is taught in all the text-books that the capillaries offer a considerable resistance to the blood-flow, but, as a matter of fact, it is so small in quantity as to be practically negligible.

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[1] *Journ. Physiol.*, Cambridge and London, 1898, vol. xxiii. No. 4.

How otherwise would it be possible for the arteries suddenly to empty themselves into the veins when the arterioles dilate, as in shock? How otherwise could the portal blood, flowing as it does at a pressure of a few millimetres of mercury, be driven through the complex capillary network of the liver?

Systemic resistance.—Resistance is much greater in the systemic arteries than in the systemic veins. This is because the bore of the individual arteries, especially of the arterioles, is less than that of the corresponding veins—for the smaller the tube the greater the friction; also because the "bed" of the venous segment is much wider than that of the arterial, and hence the venous flow is slower than the arterial, and the slower the flow the less the friction. Indeed, the venous segment is so engineered, if I may be permitted the term, as to reduce resistance to a minimum.

The excess of systemic arterial over systemic venous resistance depends essentially upon the arterioles, which can alter their calibre, and thus modify resistance, within very wide limits. Thus, on the one hand, they may entirely shut off the blood from the capillaries, as in Raynaud's disease; and, on the other hand, they may allow it to rush so rapidly into the veins as to induce fatal shock.

Pulmonary resistance.—The resistance in the proximal half of the pulmonary segment is not so much greater than that in the distal half, as in the case of the systemic segment, because the bore of the individual vessels and the width of the bed in each half of the pulmonary segment is much the same. Such extra resistance as does exist in the proximal half of this segment resides chiefly in the pulmonary arterioles.

The difference between the systemic and pulmonary resistance.—It is generally thought that the systemic segment offers a greater resistance than the pulmonary, because it is the larger and more complex of the two. This view is incorrect. By so much as the greater extent of the systemic segment causes its bed to be the larger, by so much does it cause the flow to be slower and the resistance less; and that a complex system of vessels does not necessarily oppose a high resistance to the circulation, is shown by the small resistance which the vessels of the liver offer to the portal blood; and this organ holds, be it noted, on an average one quarter of the total blood-mass. Indeed, resistance may be actually increased by diminishing vascular complexity, and contrariwise. The more the complexity of the pulmonary segment is diminished, as in phthisis, the greater is its resistance; and contrariwise, just as two lungs oppose less resistance than one, so four lungs, placed side by side, would oppose less resistance than two, and one hundred lungs similarly placed, less resistance than four, the increasing vascular complexity leading to a parallel widening of the bed, and consequent slackening of the blood-flow.

Let us then, once for all, rid ourselves of the erroneous notion that a complex system of tubes necessarily opposes a high resistance, and that the excess of systemic resistance over pulmonary is due to the greater complexity of the systemic segment. Nor can we explain this excess by the greater length of the systemic segment; the systemic veins, which are much longer than the entire pulmonary circuit, offer much less resistance. As a matter of fact, *were the two systems, pulmonary and systemic, constructed on the same lines, differing only in respect of size and complexity, the pulmonary system would offer much the greater resistance.*

How, then, are we to explain on physical principles the excess of systemic over pulmonary resistance? This excess resides within the arterial half of the systemic segment, the venous half offering a minimum resistance, and is due to the bore of the systemic arteries, especially the arterioles, being less than that of the pulmonary arteries.

It would be quite possible to construct a highly complex vascular system offering very little resistance and requiring a heart of comparatively small driving power, were it not that certain physiological ends need to be served. What we find is this: A special resistance is placed in the arterioles of each segment, this being decidedly greater in the systemic than in the pulmonary segment; while the systemic venous segment appears to be especially designed to minimise resistance.

VASCULAR RESISTANCE PHYSIOLOGICALLY CONSIDERED.—We have now to ask—(1) What objects are served by arteriolar resistance? and why is it made greater in the systemic than in the pulmonary segment? (2) What objects are served by the reduction of the systemic venous resistance to the minimum?

1. The pulmonary and systemic segments each require a certain amount of peripheral resistance in order to insure such a degree of arterial distension as shall secure a continuous, as distinguished from a pulsatile, flow in the capillaries. This special resistance is located on the arterial side of the systemic and pulmonary capillaries, the capillaries themselves, as I have shown, offering a resistance so small as to be practically negligible.

It is interesting to observe in this connection that no special resistance is placed between the portal vein and the capillaries of the liver, the blood flowing continuously in the portal vein. And we may be sure that if the blood came from the left ventricle in a continuous flow, one of the needs for arteriolar resistance would be done away with.

But why has arteriolar resistance been made so much greater in the systemic than in the pulmonary segment? A moderate resistance in the latter suffices to secure a continuous flow in the pulmonary capillaries, and we may conclude that a similar amount would secure a continuous flow in the systemic capillaries. What object then is served by placing a resistance in the systemic arterioles in excess of this? This, if I mistake not, is a very pertinent question. The answer to it explains why systemic resistance is greater than pulmonary, and why the left heart is stronger than the right.

The purpose served by this extra arteriolar resistance is, I conceive, twofold—(*a*) The adequate regulation of the systemic blood-supply to various regions of the body, in response to physiological demands; and (*b*) the overcoming of the effects of gravity on the circulation.

(*a*) The pulmonary segment stands in no pressing need of local modifications in blood-supply. The pulmonary arteries are undoubtedly under the control of a vasomotor system; but it is probable that this acts for the most part simultaneously upon the entire system of pulmonary arteries, so as to facilitate or retard the flow through the lungs as a whole. So much we may, I think, safely conclude, while not denying that it may be of occasional advantage to increase or diminish the supply of blood to some particular area of the lungs. In the case of the systemic segment, on the other hand, the quantity of blood passing through the various vascular areas requires to be regulated with great nicety, a given area requiring now much, now little, blood; and such local modifications in blood-supply imply, it seems to me, a high mean systemic resistance. To make this point clear, let us imagine a systemic circuit in which the arterial resistance is no greater than the venous. It would, under such circumstances, be quite impossible to produce wide variations in the blood-supply to a large area. In order, for example, to curtail the supply of blood to such an area, the arteries supplying it would require to be considerably constricted, and such widespread constriction would imply considerable resistance. But, it may be asked, would it necessarily imply a large increase in the total arterial resistance? Would it not be possible, by a marked vasomotor dilation of the non-constricted area, so completely to counteract the effect of the vaso-constriction on resistance that the total arterial resistance should remain at its original low level? This might conceivably be effected; but such a dilatation would manifestly lead to an excessive flushing of the dilated area with blood. On the other hand, it would be equally impracticable, in our hypothetical system, greatly to augment the blood-supply to any area; for the absence of decided resistance implies low arterial pressure, and under these circumstances vasomotor dilatation of a vascular area, say the renal, would not produce the necessary augmentation of blood-supply to it, or the needful increase of capillary blood pressure. With considerable resistance, however, and the resulting high arterial pressure, the blood-supply to any area, and the capillary blood pressure in it, can at once be greatly augmented by a dilatation of its arterioles. The area is flushed by a vigorous flow of blood. The arteriolar dilatation may now be compared to the turning on a tap of water under high pressure.

(*b*) Samways, in criticising my views, has suggested that one purpose served by the high peripheral resistance in the systemic circuit is the overcoming of the effects of gravity on the ascending arterial flow; a high systemic arterial pressure is needful for this, and blood pressure cannot be high without a high resistance.[1] In the upright position, for instance, gravity tells against the flow of blood in the carotids, and it is contended that this flow would be impossible without a high arterial pressure. The same argument applies to the flow along the brachial artery when the hand is held above the head. I have no doubt as to the validity of this argument, but I do not think that the influence of gravity on the ascending arterial flow is the primary cause of the large amount of physiological resistance in the systemic segment, and for the following reasons: Were it the essential cause, we should expect the disproportion between the pulmonary and systemic resistances to be much less marked in the horizontal than in the vertical position, but we know that systemic resistance continues to be very much greater than pulmonary in the horizontal as well as in the vertical posture; moreover, when in the horizontal posture the hand is held above the head, not by the voluntary effort of the individual, but by some one else, we do not find evidence of any great increase of arterial blood pressure. Again, in small animals, such as the mouse, in which there is every reason to believe that the same disproportion exists between systemic and pulmonary resistance as in large animals, the factor of gravity can scarcely account for the difference between the two resistances, seeing that the ascending arterial column can never be long. Further, in a large number of animals, such as the sheep, the head is habitually held at a level very little higher than the heart, and we know this particular animal has a very high arterial blood pressure. Finally, I would point out that, in considering the effect of gravity on the circulation, we must not neglect the syphon action of the blood vessels, which tends to neutralise the effect of gravity on the ascending current.

The force required to drive a fluid through a rigid U-shaped tube is exactly the same whether the bend be turned upwards, downwards, or horizontally; for in the first two cases the retarding tendency of gravity on the ascending current exactly neutralises its accelerating tendency on the descending current. This is the principle of the syphon. Were the blood vessels rigid, gravity would exercise no influence whatever on the circulation, but being elastic they yield to pressure, and hence the blood tends to accumulate in and distend the most dependent vessels, from excess of hydrostatic pressure in them. Nevertheless, even in the elastic blood vessels, the influence of gravity is largely neutralised by syphon action. Thus, while in the upright posture it works against the ascending flow in the arterial half of the carotid arc, it favours the flow in the descending venous half, and *vice versâ* in respect of the dependent aortic circuit. Or, neglecting altogether the influence of gravity on the venous flow, we may set the accelerating tendency of gravity on the large descending arteries of the body against its retarding tendency on the ascending arteries of the head and neck.

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[1] In Samway's own language, a high arterial blood pressure "is essential to prevent a limb from becoming bloodless, through gravity, when elevated above the heart, thus leaving it free to assume any attitude."—*Lancet*, London, 1896, vol. ii. p. 905.

It would not be difficult, of course, to show that, owing to the elasticity of the blood vessels, the principle of the syphon does not apply rigidly and in all particulars to the circulation. Nevertheless, I have, I think, brought forward sufficient evidence to prove that the primary object of the excess of systemic over pulmonary resistance is not the overcoming of the influence of gravity on the ascending arterial flow.

There is, however, a second way in which gravity would seem to necessitate a special arteriolar resistance in the systemic segment. Owing to the elasticity of the blood vessels, the blood tends, as I have said, to accumulate in and distend the most dependent vessels, and this tendency, as Leonard Hill has shown, has to be met by arteriolar contraction. If we suppose no special resistance to reside in the systemic arteries, the blood would very soon gravitate into the lower half of the body, directly the horizontal position is changed for the vertical. The arterioles in the dependent parts, notably in the splanchnic area, contract to prevent this, and this necessitates considerable arteriolar resistance, and a concomitant increase of arterial pressure, which is available for helping the ascending arterial current. Seeing, however, that this mechanism does not come into play in the horizontal position, it cannot be the chief cause of the excess of systemic over pulmonary resistance.

2. At certain parts of the vascular circuit, special provision is made for the diminution of resistance. The systemic venous segment is, if I mistake not, especially constructed to this end. The blood having once passed through the capillaries and venules, it is obviously of advantage that it should encounter the least possible resistance in its journey to the right heart. Indeed, in the upright position, the ascending venous blood has all its work cut out for it to reach the right auricle—so much so, that it requires help in the shape of thoracic and cardiac aspiration. Hence it is of paramount importance to reduce venous resistance to a minimum. It is remarkable how effectually venous resistance is kept down in such large animals as the whale and the elephant. The capillary pressure in the whale is probably in many places no more than that of the mouse, and yet it suffices to drive the blood through the vast and complex venous system of the

former animal. Could any fact better show that a highly complex vascular system does not necessarily oppose great resistance to the blood-flow?

I once thought that a low venous resistance was needful for the protection of the capillaries from an unduly high pressure, which would not only be injurious to the capillary walls, but would interfere with the proper interchange between the blood inside and the fluids outside the capillaries; but a consideration of the comparatively high resistance on the distal side of the intestinal capillaries, and the very high pressure which the capillaries of the foot have to sustain in the upright position of the body, has led me to doubt this.

We have seen that the chief factors in keeping down systemic venous resistance are the largeness of the bore of individual veins, and the large capacity of the entire venous segment. The latter serves another function by providing a reservoir for blood not required elsewhere. It may indeed be that this is the sole purpose served by the large systemic venous capacity, but I scarcely think so, for the excess of venous over arterial capacity is more than is necessary to fit it to serve simply the part of reservoir; all the blood in the body can be held by the splanchnic veins, but even without these veins the systemic venous is larger than the systemic arterial system. Hence it seems probable that one of the objects, possibly even the primary object, of the great capacity of the former is to reduce resistance to a minimum, the large size of this segment thus necessitated being only accidentally, as it were, made use of for the purpose of storing blood not elsewhere required.

FOOD *VERSUS* PHYSIC.

By John Haddon, M.D., *Denholm, Roxburghshire.*

Of late years, there have been suggestions made to limit the number of subjects in which the medical student has to pass an examination before receiving a qualification; and all experienced practitioners will admit that the medical curriculum requires revision. The letter of M.D., T.C.D.,[1] in which he complains that when he was a student he was taught what was of least use to him in practice, while the subjects that would have been of use to him, he was left to pick up from such observations as he was able to make, shows forth the universal experience of the profession. He complains that he was not taught how to feed an infant; but was he taught how to feed himself, a far more difficult matter? I know I was not, and I have suffered much in consequence of my ignorance. Very early in my career I saw that much illness was caused by food, but only recently has the importance of the subject been brought home to me, and at last I begin to realise that, as infectious diseases have been banished by the study and practice of what is known as preventive medicine, so may all diet-produced diseases, which are not less numerous or important, be banished by the study of food, and the adoption of a rational diet.

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[1] *Brit. Med. Journ.*, London, 21st October.

When first that truth dawned upon me, I felt like a guilty creature, having been, through my ignorance, trifling with my own health, as well as with that of my patients, and blind to the cause of symptoms so commonly met with.

It is true that a false theory misled the profession, and made us believe that animal food was an absolute necessity, especially when doing hard work; but that theory had been disproved. And still I remained ignorant of the facts that man, originally, must have been a frugivorous animal, and can live and thrive better if he abstains altogether from animal food. Having once realised my ignorance, I felt compelled to study the subject of food, and now feel constrained to do what I can to get all my professional brethren to do likewise, believing that diet is infinitely more potent in the prevention and cure of many diseases, than drugs.

We must confess that medical men are as ignorant of dietetics as their patients, and that each has to stumble along the best way he can, once he begins to suffer in person from diet-produced disease. Such ignorance of dietetics is not creditable to our profession, and the sooner we recognise the importance of the subject, and study it, the better it will be both for ourselves and our patients.

The *Brit. Med. Journ.*, London, of 4th November, contains the report of a discussion on "Headaches and their Treatment." What a galaxy of names appears as taking part in that discussion! Dr. Lauder Brunton opened it. To produce headache, he thinks a general and a local condition are necessary. The general condition depends on some disturbance of nutrition, and he confesses that the nature of that disturbance is hard to determine, because our knowledge of nutrition generally is insufficient, but he inclines to the belief that, as a rule, the liver is at fault. He confesses that a highly nitrogenous diet conduces to the disturbance of nutrition, by the production of poisons in the intestines, and that a non-nitrogenous diet will prevent the headaches. Nevertheless, in treatment, he relies upon drugs. "From personal experience," he writes, "the easiest way of getting rid of the toxines or of counteracting their effect, I do not know which, is to keep up the action of salicylic acid, or salicylate of soda." After such a confession of ignorance by Dr. Brunton, as to the action of these drugs, lesser lights may be excused for having their own opinion on the subject.

I have formed the opinion that the best and most rational, though by no means the *easiest*, way of getting rid of such symptoms as Dr. Brunton credits these toxines with producing, is to abstain from eating the flesh of animals, which, being richest in nitrogen and used so largely as a food, is, I feel certain, the cause, either directly or indirectly, of all the symptoms toxines can produce. Immediately following the discussion on headaches, there appears in the same journal a paper by Dr. Haig on "The Treatment of Headaches."

He believes that uric acid in the blood accounts for many headaches, and he advises all uric acid to be cleared from the body, and then describes how he thinks that can be done. I do not express any opinion as to whether Dr. Haig is right or wrong in attributing so much power to uric acid, but I have no doubt that his advice, if followed, will relieve, if not cure, the great majority of headaches, as well as many other symptoms which are quite as common and troublesome.

It is now many years since I estimated the urea that I passed daily, for a month, that I might know how it varied in health, so as to be able to judge as to its significance in disease. I found it varied so greatly in health, from day to day, that it was of no use as a guide in disease. I have since learned—(1) that it varies directly with the amount of nitrogenous food eaten; (2) that the acidity of the urine varies directly with the urea it contains; and (3) that to avoid animal food is the quickest and best way to lessen the acidity of the urine, which is the cause of so much discomfort to many.

Thus, then, seeing that all the nitrogen we require is just as much as will supply the small amount of tissue waste that takes place, and seeing that when we eat much food rich in nitrogen, such as the flesh of animals, we are putting into our bodies a substance which acts as a foreign body, and must be got rid of by the digestive and excretory organs in the form of urea, need we wonder that those more especially who follow sedentary occupations, and eat a large amount of animal food, sooner or later, according to the strength of their digestive organs, suffer from all sorts of symptoms due to the ingestion of nitrogen? Whether toxines or uric acid be the nemesis of the foul feeder matters little, but all experiments and observation proclaim that nitrogenous food is the primary cause of those protean symptoms, which, in our ignorance, we call gouty, including all manner of headaches, toe-ache and belly-ache as well.

If, then, I am right in my conclusion, the best and quickest way to relieve those aches, and, so far as possible, cure them, is to make all such sufferers strict vegetarians, and allow them to eat no animal food whatever. We have no observations which tell us the exact amount of nitrogen our tissues require to repair their waste, under various forms of occupation, and until such observations have been made we cannot tell how much to take, but there is good reason to believe that we do not require nearly so much as we are generally supposed to do. Pavy in his work[1] relates the case of Thomas Wood, the miller of Billericay (reported to the College of Physicians in 1767, by Sir George Baker), who lived in vigour for upwards of eighteen years on no other nutriment than 16 oz. of flour, made into a pudding with water. That represents 112 grs. of nitrogen, and 2688 grs. of carbon. Thus we may conclude that 112 grs. of nitrogen are sufficient to supply the waste of the tissues in the work of a miller, although it is taught that 300 grs. are necessary for every one.

Agreeing then, as I do, with Dr. Haig, in his advocacy of a diet drawn chiefly from the vegetable kingdom, as the best advice that can be given to all gouty people, as well as to all men, I am persuaded that even Dr. Haig prescribes more nitrogen than further observation and experiment will convince him we require.

I have myself lived for weeks without any food (even eggs or milk) derived from the animal kingdom, and felt my general health and vigour improved, if anything, by the change; while many vegetarians, of all ages, have lived for years in the same way, with the best results.

To prove my contention, that it is the ingestion of food rich in nitrogen that causes so much of the disease we are called upon to treat, I will relate three cases, presenting very different symptoms:

Case 1.—A woman, æt. 40, one of two sisters, had suffered from general ill health and anæmia for three years. She had been treated by drugs, all sorts of supposed nourishing animal food, and wine. All drugs were stopped, and she was put upon three meals daily, consisting of wheat-meal porridge night and morning, and rice in the middle of the day, with a tumblerful of skim milk at each meal. That diet she continued for six weeks, at the end of which time she was in perfect health, and the other sister confessed that the former invalid was the stronger of the two.

Case 2.—A man, æt. 45, suffering from Ménière's disease, was having an attack every week. He had consulted a leading ear specialist, who advised him to cycle so as to reduce his weight. His diet was a liberal one, consisting largely of animal food, and still he was hungry between meals. He was put upon a restricted diet, avoiding butcher meat, and eating three times a day. He at once lost that hunger which he formerly felt between meals, his girth diminished, and he was more able for exertion. It was on 11th March 1897 that he had his last weekly attack, when he was very sick, and ill two days. From that day he gave up eating butcher meat for three months. His first attack, on the changed diet, came on after an interval of nine weeks, and he was from home at the time. That was the last attack in which sickness occurred. The next came on in eight weeks, and the next, which was his last, in eight months. Now, although he does take a little butcher meat, he is very careful in eating, and continues free from the attacks. Nevertheless, the deafness and noise in the ear continue.

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[1] "Food and Dietetics."

It is a curious fact that that patient's mother had similar attacks without any ear symptom, until she was persuaded to change her diet, when they ceased.

CASE 3.—A stout old lady, suffering from a weak heart, quite an invalid, and unable for any exertion, was persuaded to avoid animal food, and live on a very light diet. She experienced great benefit, was able to walk and sleep as she had not done for years, and with gratitude declared that she never expected to be so well again.

Such cases resemble the marvels we read of as resulting from the administration of some quack nostrum, and yet the happy result was obtained merely by eliminating butcher meat from the diet.

Since I have made experiments in dietetics, I have been astonished at the effect of animal food on the action of the bowels and kidneys, the two great highways of the system, on the free action of which health and happiness depend. Animal food, in the majority of dyspeptics, acts like closing a tap on both those outlets, while a simpler diet opens the tap.

In this connection I may mention the case of a lady at the menopause, who for years had been an invalid and never had a motion without medicine. Upon the following bill of fare her bowels acted daily without any medicine:

Breakfast.—A raw, ripe apple, whole wheat-meal bread with butter, and a cup of cocoa made with water.

Dinner.—Vegetable soup, with one slice of whole-meal bread, toasted hard and added to the soup, followed by two potatoes.

Supper.—The same as breakfast.

I hope that these facts are sufficient to prove the value of diet in the prevention and cure of disease, and to convince every member of the profession that there ought to be a Chair of Dietetics in every medical school, so that the students might be properly instructed, and enter upon their work, as practitioners, fully alive to the importance of the subject, and able to recognise the symptoms which errors in diet produce.

ULCER OF THE CORNEA.[1]

By A. MAITLAND RAMSAY, M.D., *Ophthalmic Surgeon, Glasgow Royal Infirmary, etc.*

ULCERATION of the cornea not due to direct injury is the result of the breaking down of a localised inflammatory infiltration, which reaches the surface by causing the destruction of the epithelium in front of it. Corneal ulcers, therefore, if not traumatic, are always secondary to disease previously existing in the eye, and most of them are complications of conjunctival affections. For clinical purposes they may be divided into those which occur (1) in conjunctival affections, (2) through abnormal exposure of the eyeball, (3) in diseases due to interference with the nerve supply, (4) through the breaking down of a cicatrix, (5) from the improper use of a lead lotion—saturnine ulcer.

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[1] A post-graduate lecture delivered at the Ophthalmic Institution, Glasgow, 28th November 1899.

1. Conjunctival Affections.—(*a*) *Catarrhal ophthalmia.*—In this, more particularly in adult cases, there are found, for the most part on the margin of the cornea, small grey crescent-shaped ulcers, generally superficial, and by their coalescence occasionally producing a breach of surface of considerable size. They are the result of thrombosis of the blood vessels at the limbus corneæ, and, if carefully treated from the outset, rarely cause perforation.

(*b*) *Purulent ophthalmia.*—In this, whether in adults or in newly-born children, there occur sloughy ulcers, which may be either central or marginal, those on the margin being sometimes concealed by chemosed conjunctiva overlapping the surface of the cornea. They may completely surround the cornea, leaving the centre a sequestrum. They are rapidly progressive, as there is always round them an infiltrated area, which may spread either in depth or along the surface. When the cornea is destroyed down to Descemet's membrane, the base of the ulcer is quite bright, owing to the exposure of the posterior elastic lamina, but this appearance ought never to be mistaken for the clean smooth surface of a healing ulcer. As a result of the intra-ocular tension, the membrane bulges forwards, and perforation usually takes place.

(*c*) *Strumous ophthalmia.*—In the conjunctivitis of strumous children many different forms of ulceration are seen. Sometimes there is only a tiny abrasion of the corneal epithelium, which, from the intense photophobia and blepharospasm to which it gives rise, can with difficulty be detected without staining by fluorescin. In other cases there is a transparent faceted ulcer, which looks as if a little bit had been chipped out of the surface of the cornea. Indolent, and always very difficult to heal, this may become vascular, and persist for many weeks as a red speck; but it rarely perforates. Sometimes a vascular papule forms on the limbus corneæ, and, followed by its leash of blood vessels, moves in towards the centre of the cornea. In such a case its track may persist for a very long time. Should a pustule situated in the corneo-scleral margin suppurate and ulcerate, it may rapidly cause perforation of the cornea with prolapse of the iris. At times, especially in unhealthy children, an abscess forms in the centre of the cornea, and, bursting externally, gives rise to a purulent ulcer. Pus forms within the layers of the cornea—onyx—and, accumulating in the anterior chamber, gives rise to hypopyon.

(*d*) *Ulceration may also occur in trachoma,* where it is always to some extent present along with pannus; *in trichiasis,* where misdirected eyelashes irritate the cornea; and *in lithiasis,* where an exposed chalky particle in either the upper or lower lid scratches the front of the globe.

2. ABNORMAL EXPOSURE OF THE EYEBALL.—When the eye is not properly protected by the lids, as in ectropion, lagophthalmos, or proptosis, the cornea suffers, and ulceration takes place, as a rule, at its lower part.

3. DISEASES CHARACTERISED BY INTERFERENCE WITH NERVE SUPPLY.—More especially is the complication noticed in the last paragraph apt to occur, when, in addition to the unnatural exposure, there is also interference with the function of the fifth cranial nerve. This is seen in its most pronounced form as a diffuse purulent infiltration of the cornea, which may follow excision of the Gasserian ganglion or paralysis of the trigeminus through disease. Ulceration is not uncommonly found in absolute glaucoma, where, as the result of the increased intra-ocular tension, there is want of sensation in the cornea. In old and debilitated people it is said often to arise from exposure to cold; but here also the special vulnerability and rapid destruction are more probably due to defective nerve supply, and may consequently be considered in the same category as keratomalacia in either badly nourished infants, or in the last stages of exophthalmic goitre.

4. THE BREAKING-DOWN OF A CICATRIX.—This is seen in cases, whether due to traumatism or to disease, in which the scar that has been left breaks down from time to time, and the ulceration begins afresh. This form of ulceration occurs most frequently in the gouty or the scrofulous.

5. THE IMPROPER USE OF A LEAD LOTION—SATURNINE ULCER. —If, in ignorance, a lead lotion has been applied in a case of corneal ulceration, a deposit of white-lead will form upon the raw surface, and give rise to a staring white opacity, which is permanent.

In diseases of the eye in which severe ulceration of the cornea occurs, the complication is so serious as for the time being to overshadow the original disorder. Hence the necessity for careful examination in all such cases, so that the treatment may be directed to prevent, if possible, the cornea from becoming involved, or to limit the area of destruction if ulceration has already taken place. It must be remembered also that a simple abrasion of the cornea may be changed, by infection from diseased eyelids, and more particularly from discharge in cases of blennorrhœa of the tear sac or of disease of the nasal mucous membrane, into a sloughy ulcer which may destroy the eye completely.

Corneal ulcers may be classified into superficial and deep, central and marginal, progressive and healing; but two forms require special notice—the serpiginous and the rodent. The former is, in almost every instance, the result of some injury—probably trivial in itself—where the raw surface has been infected, either at the time, or afterwards, by discharge from the tear passages. It receives its name from the tendency it has to creep over the surface of the cornea, and it is, in about 75 per cent. of cases, complicated by hypopyon. It is specially characterised by a crescentic, undermined, suppurating margin in the direction in which ulceration spreads, whilst healing goes on along the opposite border. This peculiarity may be explained by the fact that the micro-organism specially associated with this form of ulcer—pneumococcus—is unable to live in a tissue after its products have reached a certain stage of concentration. Unless a very extensive area of the cornea has become involved, typical serpiginous ulcer does not tend to perforate, differing in this respect very markedly from some other purulent forms in which the streptococcus has been found, and where the tendency is to rapid destruction of corneal tissue and early perforation. Pain and photophobia may be very severe while the ulcer is superficial, but as the disease progresses the pain lessens, reappearing, however, if the iris and ciliary body become involved. Rodent ulcer usually occurs in elderly people, and often develops on the arcus senilis. It travels slowly round the cornea and spreads towards the centre, leaving a trail, due to cicatricial opacities. Though slow to heal, it rarely causes perforation. It is usually accompanied by great suffering.

The subjective phenomena associated with ulcers of the cornea are much more pronounced in the superficial than in the deep forms. In the former, the nerves are exposed and irritated; in the latter, they have been destroyed. As a rule, photophobia is always worse in children, more especially in those who are strumous, than in adults. Pain, often very severe, in and around the eye is a sure sign that the ulcer is progressive. It reaches its maximum immediately before perforation, but sudden relief is experienced as soon as the cornea gives way. Pericorneal injection, always present but varying in intensity, is usually most pronounced in adults, and, when severe, indicates clearly that active mischief is in progress. Should there be inflammation of the iris and ciliary body, the injection is concealed by chemotic swelling of the ocular conjunctiva. When an ulcer is progressive, its surface is uneven, and greyish or yellowish in colour, and its edges are ragged, steep, swollen, undermined, and wholly or in part infiltrated with pus. Both pericorneal injection and subjective phenomena are acute. If, on the other hand, an ulcer be healing, its surface is clean and smooth, its edges are even and rounded, and the cloudiness beyond tends steadily to clear up. The pericorneal injection and the subjective phenomena gradually disappear.

A further stage in the healing process is marked by the development of "vessels of repair" running towards the ulcer from the limbus, and preventing extension of the sore; but it must be remembered that, although an ulcer which has become vascular does not grow larger, it may increase in depth and ultimately perforate. Immediately after all the necrosed tissue has been removed, there is a rapid development of epithelial cells to cover the surface, and of connective tissue to fill up the cavity. As a rule, these two processes go on simultaneously, so that by the time the surface of the ulcer has become protected by epithelium, the depression has been raised to the level of the surrounding cornea. Sometimes, however, the surface is completely covered long before the lost substance has been replaced by new tissue—*e.g.*, in "indolent," "transparent," or "corneal-facet" forms.

COMPLICATIONS.—In severe ulceration, as for example after the eye has been burnt, the whole substance of the cornea is destroyed and melts away, with the exception of Descemet's membrane. This, denuded of the other layers of the cornea, escapes the general destruction for the time being, and presents a smooth shining surface, which must on no account be taken for a sign of the healing of the ulcer. Such an error ought never to arise, because all the other signs and symptoms point to rapid progression; and probably within twenty-four hours Descemet's membrane also will have given way, and the iris will be seen lying exposed and prolapsed. In some cases, however, simple perforation is to be regarded as a favourable occurrence, because after the aqueous has escaped, and all pressure has in consequence been removed, the disease is arrested and healing begins. If the perforation be in the centre, the anterior capsule of the lens will come forward against the posterior surface of the cornea immediately after the aqueous chamber is emptied; but if the rupture takes place at any other part, it is the iris that comes forward, and the intra-ocular pressure is sufficient, on the escape of the aqueous humour, to force it into the gap, and, as a rule, to cause it to prolapse beyond the cornea. In cases where ulceration is extensive and rupture of the cornea occurs, the damage to the eye is so great that the lens becomes dislocated, and sometimes escapes from the globe, followed by a gush of vitreous humour. Such a complication is occasionally accompanied by intra-ocular hæmorrhage, and may be followed by panophthalmitis.

Hypopyon is present, as has been already noted, in about 75 per cent. of all cases of serpiginous ulcer, and in many cases there is also the additional complication of irido-cyclitis. The pus in the anterior chamber is derived partly from the ulcer through a perforation in Descemet's membrane, and partly from the inflamed iris and ciliary body. In the absence of inflammation of the iris and ciliary body, a comparatively large hypopyon can become rapidly absorbed, but when the ulcer is complicated by irido-cyclitis, the collection of pus in the anterior chamber tends to persist, and usually varies in amount from day to day. There is great accentuation of all the subjective phenomena, and pain, often markedly nocturnal in character, radiates from the eyeball along the branches of the fifth nerve. The pupil dilates irregularly to atropine, the anterior chamber is deep, and the ocular conjunctiva is raised above the level of the cornea as a fleshy chemosis, the colour of which varies from a bright to a livid red, according to the degree of implication of the uveal tract. It is a wise rule, therefore, before giving a prognosis in a case of hypopyon-ulcer, to instil atropine and watch its effect upon the pupil. The more quickly the iris responds to the influence of the mydriatic, the more favourable will be the course of the disease.

SEQUELÆ.—An ulcer which has involved the substantia propria of the cornea, always leaves a cicatrix, which is dense and permanent in proportion to the severity of the previous inflammation and the loss of corneal substance. A scar of this kind receives different names, according to its density, being called a nebula when it is but faintly visible, a macula when it is more pronounced, and a leucoma when it is prominent and milky white. The permanence of this cicatrix is largely dependent upon age—the younger the patient the more chance there is of the opacity clearing. Time also may work in its favour; but, as a general rule, no change is likely to take place after the lapse of two years. Even a very slight nebula on the cornea interferes greatly with sight, hindering the entrance of light and producing astigmatism. When vision has been thus disturbed in early life, squinting and nystagmus are apt to develop as the child grows older.

Where an ulcer goes on to perforation, it is always followed by a leucoma, and in this case the iris is adherent to the posterior surface of the cornea—leucoma adherens—the pupil being at the same time altered in shape and displaced towards the cicatrix. The rupture of the cornea is apt to cause dislocation of the parts within the eyeball, and the apposition of the iris to the cornea will probably in time bring about obliteration of the corneo-iritic angle and blocking of the anterior filtration spaces. When this occurs, the damaged eyeball becomes hard and painful, intra-ocular hæmorrhage and panophthalmitis may supervene, and, in addition, there is in weakly subjects a great tendency for the corneal cicatrix to break down, and for ulceration to begin afresh. When the destruction of the cornea has been great, the newly-formed connective tissue covering the prolapsed iris, unable to resist the force of the intra-ocular pressure, bulges and gives rise to a partial or a complete staphyloma. It occasionally happens that, after perforation, the opening of the cornea does not close properly, and a fistula remains, from which the aqueous drains away constantly. If the opening does not close within a short time, the nutrition of the eyeball suffers severely, and the globe softens and shrivels and undergoes those degenerative changes which are grouped under the term phthisis bulbi.

PROGNOSIS.—A favourable prognosis may be given in all forms of ulceration of the cornea, provided there has been skilful treatment from the very outset of the disease. Each case, however, must be judged on its own merits, and the prognosis will be influenced not only by the nature, size, and situation of the ulcer, but also by the state of the patient's health. When ulceration of the cornea complicates conjunctival affections, the earlier it occurs the worse the prognosis. Simple traumatic ulcers are, as a rule, very amenable to treatment, but if they become infected—for example by blennorrhœa of the tear passages—the prognosis must always be guarded. In women who are nursing, and in patients suffering from diabetes or albuminuria, suppuration and hypopyon are very prone to occur after even a trival injury to the cornea, and such cases are also very liable to be complicated by inflammation of the iris and ciliary body. In serpiginous ulcers, the more quickly the pupil dilates after atropine has been instilled, the more favourable will be the course of the disease. If the ulceration has invaded the substantia propria of the cornea, and more especially if the healing process has been accompanied by a large development of newly-formed blood vessels, a permanent opacity is certain to remain, and the degree of the scarring and the permanence of the cicatrix will depend upon the depth of the ulcer and the length of time it has taken to heal, as well as upon the age of the patient and the energy and fidelity with which appropriate treatment has been carried out.

TREATMENT.—In the numerous cases in which ulcer of the cornea is the result of conjunctivitis, or of blepharitis, or of affections of the lachrymal passages, or of the nasal mucous membrane, the essential part of the treatment consists in the cure of those diseases. Once the cause has been removed, the ulcer in many instances heals spontaneously. In the treatment of inflammations of the conjunctiva complicated by ulceration, care must always, however, be taken to protect the cornea from the action of the caustics employed (which should be solutions of nitrate of silver rather than of sulphate of copper); while irritating astringent collyria, especially those containing alum or acetate of lead, ought never to be employed.

In the treatment of the ulcer itself, the most important indications are to keep the eye at rest, to protect it from further injury, and to subdue pain. In all severe cases the patient must be kept in bed in a darkened room. The lids should be closed by a bandage, which not only keeps the parts at rest, but also, by excluding light, diminishes the risk of inflammation of the iris. In slight cases it is sufficient to bandage one eye only, and to protect the other by a shade, but in every case in which the symptoms of irritation—pain, photophobia, lachrymation, etc.—are pronounced, it is necessary to cover both eyes. In order that the bandage may lie smoothly and not exert unequal pressure, the hollows at the inner canthus and beneath the orbital margin must be filled up carefully with cotton-wool, a bandage badly applied is worse than useless. In the very young, great care must be taken to prevent the bandage from becoming displaced; and in very restless children, as well as in strumous patients and in cases where there is profuse discharge, it may be necessary to dispense with it altogether. With these exceptions, it should be constantly worn until the surface of the ulcer has become covered by epithelium, and the freshly formed cicatrix is sufficiently strong to resist the force of the intra-ocular pressure.

Next to the bandage, atropine plays the most important part in the treatment of ulcers. Its action in dilating the pupil and paralysing the ciliary muscle insures physiological rest for the eye, while locally it soothes the nerves and diminishes congestion of the blood vessels. A one-per-cent. solution of the sulphate is most commonly employed, and in mild cases it is usually sufficient to instil a drop once a day; but as the object of the treatment is to keep the pupil constantly dilated, the solution must be reinstilled just as often as is necessary to maintain full mydriasis. When pain is acute and there is much congestion of the iris, the good effect of the atropine is greatly increased by applying several leeches to the temple. It must not be forgotten that atropine acts on some persons as an irritant, producing redness and swelling of the eyelids accompanied by an eczematous eruption of the skin in the neighbourhood of the eye. When this occurs, the use of the drug must be at once stopped, and one of the other mydriatics—duboisine, hyoscine, etc.—substituted for it. In certain rare cases, also, atropine may cause general intoxication and produce acute mania. It is always necessary, therefore, to guard against any of the solution finding its way into the mouth; and while it is being instilled the lid should be drawn well away from the eyeball, to prevent it from being sucked into the tear passages. Moreover, when the patient is to employ the drug himself, it is always safer to prescribe it as an ointment than in liquid form. The use of atropine is contra-indicated when the ulcer is deep and situated at the margin of the cornea, or when it is threatening to perforate.

By means of a bandage and atropine, many cases of ulcer of the cornea may be readily cured, but when pain is severe and there is much pericorneal congestion, great benefit is obtained from the application of fomentations. Moist heat diminishes the engorgement of the blood vessels, and so, by reducing tension, diminishes pain. A fomentation for the eye is prepared as follows:—A double layer of boracic lint, 3½ in. square, is laid on a towel in a basin and boiling water, to which a solution of carbolic acid (1 in 20) has been added in the proportion of about 4 to 6 drms. to the pint—just sufficient to give an odour of phenol to the fomentation—is poured over it. The lint is then squeezed as dry as possible by wringing it in the towel, laid over the closed eyelids, and covered by a piece of jaconet or oiled silk 3¾ in. square. Over this is placed a thick layer of absorbent cotton-wool, which is kept in position by a roller bandage applied as lightly as possible. When pain is very severe, fomentations are used every two or three hours, day and night; but, as soon as the suffering begins to abate, application morning, noon, and evening is usually sufficient, and is necessary during the night and early morning only if the suffering be so great as to prevent the patient from sleeping. They may be made more soothing by the addition of a teaspoonful of the sedative solution of opium, and by preparing them with an infusion of chamomile flowers.

If, in spite of such treatment, the ulcer continues to progress, disinfectants must be applied to its surface. The eye should be freely irrigated with a hot saturated solution of boracic acid, and after all the discharge has been washed away and the floor of the ulcer made as clean as possible, it should be dusted with a powder composed of equal parts of iodoform and boracic acid very finely triturated. Many other disinfectants may be used, *e.g.*, bichloride of mercury 1 in 8000, chinosol 1 in 4000, formol 1 in 2000, etc., and the ulcer may be painted carefully over with solution of nitrate of silver or protargol, or with pure carbolic acid; or a few drops of a solution of corrosive sublimate, 1 in 2000, may be injected beneath the conjunctiva. In addition to these local means, general constitutional treatment is nearly always necessary. The patient must be well fed, and, if old and debilitated, ought to have a small quantity of alcohol with meals, the malt liquors if they do not disturb the digestion being preferable to any other form of stimulant. In strumous cases it is of the first importance to attend to the kind of food the patient eats, and all forms of sugar must be rigidly excluded from the dietary. Whenever there is purulent infiltration of the ulcer, quinine in full doses always does good, and if there be much pain, opiates may be added.

When the margin of the ulcer is much infiltrated and is steadily spreading over the cornea—*e.g.* in serpiginous ulcer—these means may not be sufficient to prevent its further extension and to avert perforation. Under such circumstances no treatment is so satisfactory as the application of the actual cautery to the infiltrated spreading margin, and as the infiltration always extends beyond the apparent limits of the ulcer, the boundaries should be clearly mapped out by instilling a few drops of an alkaline solution of fluorescin immediately before applying the cautery, for every part of the infiltrated margin must be thoroughly destroyed. As the healing of the ulcer is greatly promoted by the reduction of the intra-ocular tension, the cornea should, immediately after the cauterisation, be punctured at its lower aspect, and the aqueous, with any hypopyon which may be present, allowed to escape slowly. The sudden reduction of tension is always accompanied by pain, which, when the ciliary body is inflamed, is agonising; but the patient's sufferings are greatly mitigated if a fomentation be applied to the eye at once, and ⅙ gr. of morphia injected subcutaneously.

When the ulceration is very extensive and the hypopyon large, or in cases where perforation seems imminent, incision of the cornea according to the method of Saemisch is to be preferred to the use of the actual cautery. The base of the ulcer should be divided by a Graefe's knife, both the puncture and the counter-puncture being made in sound corneal tissue. Before the incision is completed, the aqueous should be allowed to escape slowly, in order to avoid, as far as possible, any sudden forward displacement of the lens. This method of treatment has the advantage of freely dividing the layers of the cornea saturated with pus, and of evacuating the hypopyon; but it has the obvious disadvantage of allowing the iris to become extensively adherent to and incarcerated in the wound. The result of this operation is occasionally unsatisfactory, but it has undoubtedly saved many eyes which would in former days have been lost, and although the scarring is frequently great, yet there is a chance of restoring useful vision by optical iridectomy. Both after a Saemisch's incision and after paracentesis of the anterior chamber following cauterisation of an ulcer, the wound ought to be kept open to permit of free drainage and evacuation of the pus coming from the inflamed ciliary body. It the wound close prematurely, the hypopyon often reaccumulates, and when the cut edges are separated to allow the aqueous to escape, pus is seen welling up from behind the iris.

Perforation may be averted by reducing the intra-ocular pressure by fomentations, myotics, or by paracentesis of the anterior chamber. Chief amongst the myotics is the sulphate of eserin, which is employed as a ½ per cent. solution, instilled into the eye every four or six hours. It is especially serviceable where the ulcers are at the margin of the cornea, or when the cornea is threatening to give way. After perforation it aids in preventing prolapse of the iris, by contracting the pupil and so drawing it tightly in front of the lens. As eserin tends to aggravate any inflammation of the iris, its use is contra-indicated in ulceration complicated by iritis. In such cases it is necessary to lower intra-ocular tension by puncture of the anterior chamber, and the subsequent instillation of atropine. Pilocarpine acts less powerfully than eserin, but has the advantage of causing no pain in the eye and brow. It is used in 1 per cent. solution of the nitrate, and at times better results may be obtained by a combination of pilocarpine with eserin, than with either drug separately. When perforation has taken place, the iris may either lie against the posterior surface of the cornea, or may prolapse. In the former case no change requires to be made in the treatment, but in the latter the prolapse, if recent, must be carefully excised. It must first be entirely freed from the perforation in the cornea, then grasped with forceps, drawn out of the opening, and excised while being held on the stretch. Should the prolapse, however, be more than two days old, inflammatory exudation will have begun to cover it and to seal it firmly to the lips of the opening, and in this case excision must not be attempted. The most favourable result is obtained when the prolapse becomes converted through cicatricial contraction into a flat scar; but should a constriction form at its base and it become pedunculated and assume a mushroom-like shape, it will not flatten down until it has been punctured repeatedly, or partially destroyed by the galvano-cautery. After a prolapse of the iris has healed, the pupil is always displaced towards the corneal scar, and if the lesion has been extensive it may be altogether hidden by the leucoma. In such cases the excision of a piece of iris opposite a transparent portion of the cornea will not only improve the sight, but will also avert the onset of the secondary glaucoma with which an eye suffering from leucoma adherens is always threatened. In young children an opacity of the cornea may clear in a wonderful manner, and this is all the more likely to occur if the ulcer has healed rapidly. The absorption of an opacity is greatly hastened by the use of stimulating applications, but these must never be employed until all signs of irritability have passed away. Ointments containing calomel, yellow oxide of mercury, iodides, etc., are chiefly used, and a piece the size of a barley-corn should be well rubbed into the eye two or three times a day, care being taken that the patient looks straight forward, in order that the massage may be applied directly to the cornea through the closed upper lid. If a full measure of success is to attend this treatment, it must be faithfully carried out and persevered in for many months, during which the stimulants employed should be varied and their strength graduated in such a way as to promote absorption of the opacity without exciting inflammation in the eye. As the cornea becomes more transparent, the vision improves, but as its curvature is always altered, cylindrical glasses are required to enable the patient to obtain the full use of his sight. If the opacity be situated in the centre of the cornea, and if no further improvement is to be expected from the use of drugs, an optical iridectomy should be performed, and the leucoma tattooed if the disfigurement be great. If the treatment described for prolapse of the iris be successful, the development of a staphyloma will be prevented. Sometimes, however, chiefly owing to want of proper care on the part of the patient, and to the large size of the perforation, the remains of the cornea and the iris bulge forwards as a protuberant cicatrix, which may partially involve or wholly replace the cornea. In partial staphyloma it is usual to perform an iridectomy, which, if successful, not only improves the sight, but, by diminishing intra-ocular tension, encourages the formation of a flat cicatrix. In total staphyloma, ablation ought to be performed and the lens allowed to escape. The gap thus produced in the ocular tunics may then either be allowed to cicatrise, or else its edges may be drawn together by means of an interrupted suture of the conjunctiva. Where the anterior portion of the sclera is thinned and discoloured through inflammation, the whole eyeball becomes distended, and the disfigurement is great; and then, as the deformed and sightless globe is liable to become hard and painful, it will be found most satisfactory to have resort either to Mules's operation or to enucleation.

THE PLACE OF PROTARGOL IN EYE WORK.

By SYDNEY STEPHENSON, M.B., F.R.C.S., *Ophthalmic Surgeon, North-Eastern and Evelina Hospitals for Children; Ophthalmic Surgeon to Queen Charlotte's Hospital, London; Surgeon to the Hanwell Ophthalmic School.*

IN external diseases of the eye, the tendency of all treatment since the dawn of the therapeutic art has been in favour of direct medication. The success that has attended such measures has undoubtedly been due to the purely local origin of a large proportion of inflammatory conditions of the conjunctiva, and its corneal and lachrymal extensions. In diseases of the mucous membrane in question, almost every known astringent and antiseptic drug has been in turn tried and advocated. Thus, alum, sulphate of zinc, lead salts, boric, carbolic, and salicylic acids, tannin, corrosive sublimate and other mercurial preparations, sulphate of copper, permanganate of potash, and a host of other remedies, have been extensively used. The length of the list shows that no single remedy has yet established its right to be regarded as a specific remedy. The one possible exception is nitrate of silver, which has until recently maintained an unassailable position in ophthalmic practice. For many years past it has been recognised as an invaluable application in the treatment of superficial affections of the eye, especially in the various forms of ophthalmia.

The use of silver nitrate, however, as every medical practitioner knows, is attended by somewhat serious limitations and disadvantages. Amongst these may be mentioned the pain it causes, its want of penetration, its caustic and escharotic action, its chemical affinities, and its liability to produce staining.

PAIN.—The pain set up by the application of silver nitrate, either in stick or in solution, is so great that it cannot be avoided in some cases even by the preliminary use of cocaine. The probable explanation is, that a congested mucous membrane is so intensely hyperæmic that it is unable to absorb the alkaloid in sufficient amount to produce an anæsthetic effect on the sensory nerve terminations. Lately, it is interesting to note, suprarenal extract has been administered simultaneously with a view of increasing the penetrative power of cocaine. The pain set up by lunar caustic is not only intense, but it may even last for hours in individual patients, so that they dread or altogether refuse further treatment. As a general rule, its duration is fortunately not longer than half an hour.

CAUSTIC AND ESCHAROTIC ACTION.—There is a liability to form eschars of the conjunctiva, even when the nitrate is used in the strength commonly employed in ophthalmic practice, namely, 10 grs. to the ounce. The formation of such an eschar means the stopping of treatment at the moment when it is most needed. With some patients the tendency to form eschars amounts almost to an idiosyncrasy; at any rate the occurrence of this unpleasant complication cannot be foretold. Broadly speaking, the greater the inflammation the more likely the eschar. The ultimate result of the sloughing set up in this way would clearly lie in the direction of scarring and distortion of lids. The untoward accident more commonly attends the application of the remedy in the form of solid stick, a plan actually recommended to this day in some of the text-books as the best for the gonorrhœal or purulent ophthalmia. This method, barbarous in the extreme, sets up great pain and swelling, and is, in my opinion, calculated to make things worse rather than better. It should also be noted that the excessive action of the silver salt undoubtedly increases the tendency to corneal complications.

WANT OF PENETRATION.—The superficial action of silver nitrate is shown in various ways. Its ready combination with the albumin of the tissues is well established, and that fact alone would apparently negative its passage into the deeper tissue, at any rate in the form of an active nitrate. When a 10 gr. to the ounce solution of the nitrate is dropped on to the conjunctiva, a delicate whitish colour appears after a few seconds, a result that is mainly, if not altogether, due to the formation of an albuminate of silver. The surface action of lunar caustic, again, is evidenced by the formation of superficial sloughs.

CHEMICAL AFFINITIES.—Nitrate of silver is not only precipitated by the albumin and chlorides of the plasma, but also by discharges and secretions, *e.g.* the chloride of sodium in the tears.

LIABILITY TO PRODUCE STAINING.—With regard to the staining of tissues, silver nitrate may be compared to some extent with lead salts applied to the conjunctiva. Both are superficial in their action, both form albuminates, and both may be locally deposited. After the prolonged use of nitrate of silver solution, the conjunctiva becomes indelibly stained. This result I have seen after forty-eight applications, extending over a couple of months. It has repeatedly come under my notice after a three-months' similar course. At first the staining is very slight, and has to be carefully looked for. Later, it gradually deepens in tint, until the whole conjunctiva acquires a peculiar olive-brown hue that is no less characteristic than disfiguring. If the solution has been painted on the everted conjunctiva, the discoloration is limited to the inner lining of the lower lid, so that no harm is done to the patient's looks. If, on the other hand, the solution has been dropped into the patient's eye, without everting the lids, in the course of time, in addition to the conjunctiva of the lid, the lower half of that of the eyeball also becomes stained. This acquired blemish is very disfiguring, and sometimes the lower half of the cornea suffers with the eyeball, and shows a curious greenish brown tint. This local staining of conjunctiva is indelible. All attempts to remove the deposit by hyposulphite of sodium and other solvents have failed in my hands, a fact that may to some extent be accounted for by the anatomical conditions. The silver is deposited as fine molecular granules of varying size in the lymphatic and perilymphatic structures, and not, as Grossmann states, in the elastic fibres of the conjunctiva. Surgical measures are obviously out of the question in the treatment of this condition, since to remove the staining would be to excise the conjunctiva.

From the foregoing facts, it will be readily inferred that silver nitrate, although a most valuable remedy in skilled hands, yet requires great care in practice. Hence for a long time past chemists have striven to replace the nitrate by an agent that would be as efficient in action, but without its drawbacks. Clearly what is wanted is an active remedy that would be safe under all ordinary conditions. Have we such a remedy in protargol?

My experiments on protargol have been conducted on three classes of cases—(1) Blepharitic; (2) conjunctival, acute and chronic; (3) lachrymal.

1. BLEPHARITIC.—This class may be dismissed with a few

words. The remedy has been employed in the form of ointment of 10 per cent. strength, combined with a base made up of equal parts of vaseline and lanoline. In the seborrhœic forms I have found no particular benefit. In the eczematous type, however, that is to say, when crusts or scabs have been present, I have found rapid cure follow the removal of the crusts and the nightly application of protargol ointment on a strip of lint. The application was not painful, but otherwise I cannot say that it seemed to possess any very marked advantage over the old-fashioned treatment by mercurial ointments. In the event of the last-named agents failing to effect a cure, protargol should certainly be tried as the first alternative remedy.

2. CONJUNCTIVAL FORMS, ACUTE AND CHRONIC.—(*a*) *Conjunctivitis due to gonococci.*—My first experiments were made with rather weak solutions of protargol, namely, 5 to 10 per cent. The exposed conjunctiva was brushed once daily with the solution, while at the same time the mucous membrane was kept cleansed with weak antiseptic lotions. Under that plan cases did fairly well; the discharge became thinner, and less in quantity; the swelling of the eyelids subsided, and corneal complications seldom occurred. But, on the whole, protargol seemed to me at that stage of the inquiry to possess no very marked advantage—beyond the lessened painfulness—over the 2 per cent. solution of argentic nitrate commonly used in ophthalmic practice. I then commenced to increase the strength of the solutions, and for several months past I have used a 50 per cent. solution, with which I do not hesitate to treat the conjunctiva in severe cases twice within twenty-four hours. At the same time I order weak antiseptic cleansing lotions to be frequently used for the purpose of removing the discharges. As a result of this experience, I can now definitely say that in my hands protargol has given better results in the treatment of gonococcal conjunctivitis than any silver salt with which I had been previously acquainted. The presence of corneal complications is no contra-indication to the use of the strong solution of protargol. On the contrary, the existence of such ulceration is an additional reason for pushing the protargol. The above experiences relate to my experience amongst babies. In older children, ranging in age between 1 and 15 years, when the age trouble is associated with pudendal discharge containing gonococci, the results obtained with protargol have been equally good.

(*b*) *Severe acute muco-purulent ophthalmia, due to Koch-Weeks' bacilli.*—All treatment of this affection is open to the fallacy that the disease is self-limiting. Bearing that fact in mind, I have found protargol as good a remedy as can be desired, painted on the conjunctiva in a solution of 10 to 20 per cent. strength. There is no particular reason why it should not be used in 50 per cent. solution.

(*c*) *In mild forms of conjunctivitis due to the presence of diplo-*

bacilli.—Protargol in my hands has produced no appreciable results, and was indeed distinctly inferior as a therapeutic agent to such remedies as the sulphate or chloride of zinc, which appears to exert a kind of specific action when supplied in a sufficiently concentrated form to this very common condition.

(*d*) *Conjunctivitis due to the Klebs-Löffler bacillus.*—In this class of malady I have not tried protargol.

(*e*) *Trachoma.*—I have given protargol an extensive trial in chronic trachoma, and have dusted it over the affected surface once or twice daily for several months together. The results have not been tangible, except that in some cases there has been some slight staining of the conjunctiva. It is only fair to say, however, that I have met with a similar negative experience in the application of most medicaments to that most intractable disease, with the exception of sulphate of copper and possibly of corrosive sublimate. In acute trachoma I found better results from a 2 per cent. solution of nitrate of silver, used for a week or more, until the acute symptoms had abated.

3. LACHRYMAL AFFECTIONS.—Protargol is, upon the whole, the best agent I have used to get rid of catarrhal inflammation of the lachrymal sac (dacryocystitis). In the treatment of these cases, after slitting up the lower canaliculus, the dilated sac is freely washed out with a 5 to 10 per cent. solution of protargol, until the return fluid is free from pus. At the same time probes are passed systematically through the nasal duct, in order to dilate the stricture which is almost invariably present as an underlying condition. In some cases a distinct benefit has seemed to follow the administration of a 3 to 5 per cent. solution, as a spray or douche to the nasal mucous membrane. No other agent I have tried appeared to reduce lachrymal inflammation so speedily as protargol.

It may therefore be stated as a general conclusion, that although protargol is not an absolutely ideal agent in the treatment of external inflammatory affections of the eye, it nevertheless offers considerable advantages, and constitutes in some instances an important advance upon the silver salt that has been its immediate forerunner and predecessor.

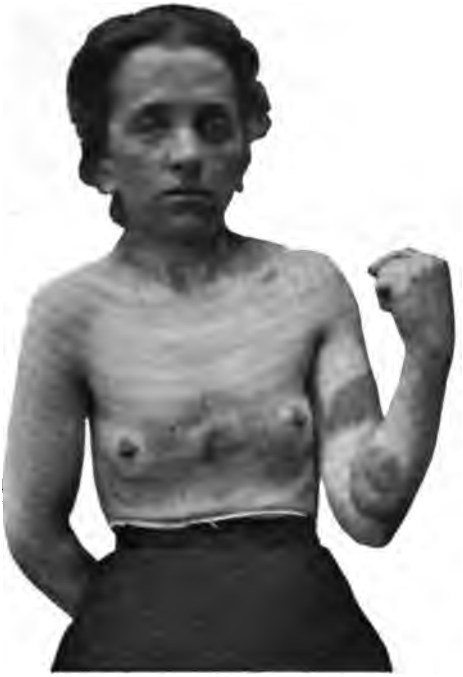
CLINICAL RECORDS.

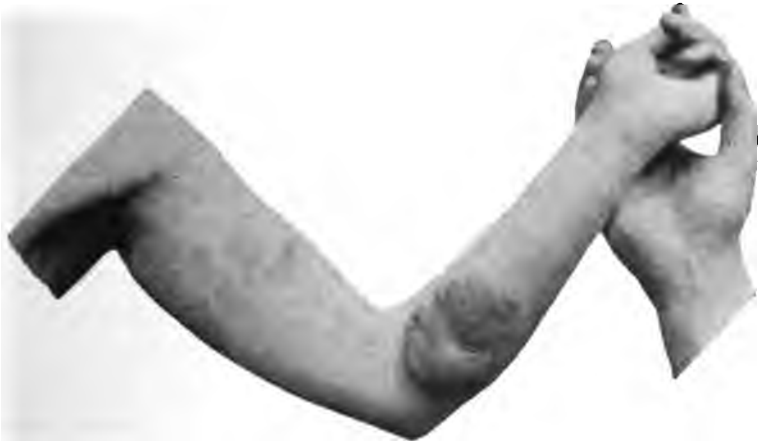
A CASE OF MOLLUSCUM FIBROSUM.

By G. L. KERR PRINGLE, M.D. (Edin.), *Surgeon to the Bridgwater Infirmary.*

(PLATE III.)

THE reported cases of molluscum fibrosum are so few in number, that I do not hesitate to report the notes on a case which came under my care a few months ago:—





The patient, a young woman æt. 23, engaged in a printing-office, is a short, pale, stunted girl, with a vacant expression, and her mental capacity is decidedly limited.

Family history is unimportant: no history of malignant disease, and no history of a similar condition can be obtained; one sister died of phthisis.

Personal history and mode of development.—Patient cannot say definitely when the condition first appeared, except that it was soon after birth. The principal tumour, which is situated on the flexor aspect of the left forearm, was the first to make its appearance. It grew rapidly, and was evidently fairly vascular, for her medical man refused to remove it because of hæmorrhage.

During the last few years it has increased in size, and its surface has become rugose and thickened, with edges overlapping the surrounding skin. It is dark and congested in colour. It is fairly movable, and is not painful. It appears to involve the skin in its deeper layers.

Present condition.—In addition to above, the back, chest, and extremities are covered with numerous small tumours of about the size of a pea. There is another large tumour on the dorsum of the left foot, which had been previously removed, but which has returned, and is now about the size of a marble.

On the extensor aspect of the right thigh, about its middle, there is another about the size of a walnut—which appears to be different from the others, in that it lies much deeper in the skin (if not below it).

The small tumours on the back and chest are of two varieties—one variety similar to the tags of skin seen about the shoulders of elderly men, and the other, which she says is an earlier stage of the former, appear as small red, raised spots.

All over the body, more especially the trunk, there are curious patches of pigmentation, which are well seen in Plate III.

One of the nodules was removed from the back, and on section showed fibrous tissue with connective tissue cells, but no glandular elements of any description.

REMARKS.—The case is one which shows both varieties of the disease, namely—(*a*) Where it occurs as small, soft tumours, varying from the size of a pea to that of a walnut; and (*b*) where it occurs as large pedunculated masses. What is most noteworthy is the disturbance of the pigmentation of the body, more especially as seen in the large triangular patch on the back and the smaller patch on the skin covering the biceps of the left arm.

The tumour situated on the right thigh might be in connection with one of the branches of the anterior crural nerve. It was, however, impossible to make out, and she refused to have it removed.

I am indebted to Mr. P. C. Barford for the photographs from which the figures were prepared.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

A System of Medicine by many Writers. Edited by THOMAS CLIFFORD ALLBUTT, M.D., LL.D., etc. Vol. viii. London: Macmillan and Co. Ltd. 1899.

THE eighth and final volume of Professor Clifford Allbutt's "System," as often happens in the case of the final instalment of an important work, is somewhat composite. The first hundred and seventy pages are occupied by the concluding papers on miscellaneous diseases of the nervous system, a continuation of the contents of the seventh volume. These are succeeded by twenty papers dealing with various aspects of mental disease, occupying about two hundred and eighty pages, which again are followed by an exhaustive series of essays by many authors on every important form of disease of the skin, filling five hundred pages. Lastly, in the form of an appendix, we find a brief but interesting and important paper on malarial fever by Dr. Manson, giving some of the newer work done by himself, Major Ross, and others.

The number of separate topics dealt with in this final volume is so considerable that it is needful for the reviewer to restrict himself to a few of them if this notice is to be kept within reasonable limits of space.

Dr. Vivian Poore leads off with an excellent summary of existing knowledge on the subject of the "professional impotences," commonly termed craft palsies. The hammerman's and the piano-player's paralyses; the writer's, the telegraphist's, and the violinist's cramp; the bricklayer's, the milker's, and the treadler's spasm; and he further includes miner's nystagmus, though this is a much less serious morbid condition. Speaking of the treatment of writer's cramp, Dr. Poore remarks that the only apparatus which is of permanent service to the sufferer is the typewriter. This is quite true, but he goes on to say that the typewriter is of no use for book-keeping; a short time ago that was the fact, but now an instrument is to be had which is specially devised for use on the pages of a book or ledger, and which promises to prove of much value to the clerk or book-keeper who is the unhappy subject of that disease.

Professor John Chiene follows with a short paper on spasmodic wry-neck, a paper characteristic of the chirurgical mind and of the writer himself. He spends little time on theories of cause or in hypothesis in any direction, but proceeds to a clear and simple anatomical statement of the muscles involved, and, after giving very short shrift indeed to any form of medical treatment, proceeds to excise a portion of the spinal accessory, which operation he describes as being usually successful; but if not, he has other and more formidable surgical measures in reserve for the peccant nervous system.

The subjects of facial spasm and of tetany are then in succession treated by Dr. Risien Russell; unhappily, neither admits of such terse description nor of like summary and generally effective treatment such as Professor Chiene dealt out in the preceding paper. Many of these miscellaneous nerve ailments, as, for example, paralysis agitans, described by Sir Wm. Gowers, are, at present, far from satisfactory, from the point of view of prognosis and treatment, however interesting in a scientific aspect. The important subject of migraine is dealt with briefly by Dr. J. Mackenzie, and that of hysteria much more fully by Dr. Ormerod. The theories of causation from malnutrition of nerve elements, from vasomotor defect, from heredity, from uterine or ovarian disturbance, from emotional instability, from tendencies in the direction of hypnotism, and, finally, from an approach to the border-land of insanity, are duly discussed: full descriptions of symptoms follow. The author shows the distinction between hysteria and neurasthenia, a line of demarcation of much importance, though sometimes difficult to draw, as the two may and often do coexist. There is much of value in the statement of therapeutic measures, preventive and curative, which concludes the article. The reviewer must confess that he never heard of "Latah" before, on which a short paper is written by Dr. Patrick Manson. The disease seems to be one of those psychopathies allied to hypnotism, which, while not unknown among the higher races of mankind, are more prevalent among mentally undeveloped types such as the Malays or the Javanese. After a brief notice of catalepsy by the late Dr. Hack Tuke, a highly interesting paper by the editor on neurasthenia follows. Apart from the professional and scientific value of Professor Clifford Allbutt's writings, there is a charm about his style, a picturesqueness of phrase, and a special richness and facility of illustration, which renders his articles peculiarly attractive, and which cause many readers to wish that the editor of these volumes appeared more frequently in the field of literature proper.

No one sees the realities of human life so clearly or comprehends them so intimately as the physician; if he, at the same time, chance to be gifted with literary powers, few can equal him as an essay writer or a novelist; and especially is this true in those strata of literature in which poetry and ethics enter into descriptions of the pathos and tragedy of life. If Dr. Clifford Allbutt had the time and the inclination, literature might boast another name worthy to be placed alongside Goldsmith or Wendell Holmes, though differing from either.

The present article on neurasthenia is probably the most able and interesting contribution to the subject the reader will meet with in English.

After a brief historical introduction, and after admitting that all classification is but a device for the convenience of the fallible human mind, the author indicates the following divisions or classes of neurasthenia:—Cerebral, spinal, cardiac, vasomotor, gastro-intestinal, and the sexual form. The first two, in general experience, are the more common and important. The story is well told of the irritable, fagged, and weary brain; the condition of mind in which every noise is a torture; in which every petty annoyance seems magnified into a calamity; in which, in the long wakeful hours of the night, everything painful and agitating dwells in the memory magnified fourfold, and will not be dismissed; while all the time the patient knows how exaggerative is the estimate his tired nervous system forms of the worries which surround him.

Several of the editor's portraits are life-like—for example, that of "the voluble, restless hunter of consulting-rooms, the connoisseur in specialists, *l'homme a petits papiers* of Charcot, spare of frame and sallow of face," who with his bunch of old prescriptions and all sorts of odd memoranda relative to his diet, his alvine evacuations, the hours he has slept, etc., always seeks advice, and seldom has memory or perseverance to follow it.

The curious terror which others have of open spaces, or the fear of being shut up in a room or a church, and unable to get out quickly; the condition in which a fairly healthy man, young or middle-aged, like the patriarch in the Book of Proverbs, "fears that which is high" and cannot bear proximity to mountains. The fear caused by looking down one can understand, but that curious dread felt by the man at the bottom of the valley who is oppressed and dismayed by the majesty of the hills, and feels he must get away from them, is very curious.

This last condition, however, Dr. Allbutt does not describe, but the reviewer has seen more than one case of it.

Mention is made in the article of the strange obsessions, the extraordinary unreasoning dreads, with which some neurasthenics are possessed. The reviewer remembers a well-educated girl of 18, who, though to all outward appearance sane and healthy, when crossing Trafalgar Square would make a considerable circuit rather than approach the stone lions at the base of the Nelson Column. She knew they were stone, and yet they filled her with terror. From that one fact alone an unfavourable prognosis was given of her future, which unfortunately was abundantly justified. The author also describes those not uncommon cases in which periods of almost feverish exertion and brightness of spirits alternate with times of exhaustion and gloom. As a necessary appendix to this article in its surgical relation, Mr. Victor Horsley contributes a valuable paper on the traumatic form of the disease.

Under the head of "Mental Diseases," to which section Dr. Savage prefixes an interesting introduction, several important papers on the mental disturbances of childhood precede an interesting article by Dr. Mercier on "Vice, Crime, and Insanity," all the more interesting perhaps because it contains certain rather debatable assertions in regard to ethics, some of which the present reviewer would like to challenge, if he had more time and space at his disposal. Dr. Clouston's article on "Epochal Insanities," and that on the phthisical form, contains much that is interesting and practical. Other writers deal with the alcoholic and toxic insanities, with mania, melancholia, stupor, and the general treatment of these various conditions, and the subject is concluded by Dr. Nicholson's account of criminal lunacy in England. The important section on "Skin Diseases," in the production of which Dr. Payne has co-operated with the editor, forms a complete and exhaustive digest of the whole subject, of which it may be remarked that with one exception the writers are all London specialists or practitioners.

In concluding this brief and imperfect review of the last volume of Dr. Clifford Allbutt's "System," the reviewer cannot rest satisfied without a word or two regarding the great and distinguished merits of the whole work, and the debt the profession owes primarily to the editor as well as to his numerous collaborateurs. It would have been difficult to find, within the limits of the British medical profession, any man more peculiarly fitted to initiate and direct a work of this kind than Dr. Clifford Allbutt.

Medicine changes rapidly, and yearly becomes more profound in its thoroughness and scientific character, and wider in its area. More and more difficult does it become to comprise all its essentials in any one treatise which shall be at once full, adequate, and yet moderate in bulk, while at the same time so arranged that the practitioner who wants help and light on any point can quickly and readily find it. In general it may be remarked that the editor has been wise and fortunate in his choice of writers. To escape all criticism in this respect is of course impossible. The general result unquestionably is that we have in this "System" a landmark in English medical literature well representative of the best work of the closing years of the nineteenth century.

RICHARD CATON.

Beiträge zur Pathologie und Pathologischen Anatomie des Centralnervensystems. Von Dr. ARNOLD PICK. With 205 Illustrations. Berlin: S. Karger.

THIS work is very appropriately dedicated to his friend Otto Kahler. The names of Kahler and Pick are well known to all neurologists, for by their combined efforts many important facts have been determined, which have advanced our knowledge of the structures and functions of the human nervous system. Published as a Festschrift in the five hundred and fiftieth year of the University of Prague, this collection of unique cases so admirably recorded by the distinguished Professor is worthy of the occasion, and should be read by all neurologists; for in it they will find a store of material for reflection.

The first 168 pages deal especially with various forms of cortical speech affection. Each of the thirteen chapters in this portion of the book deals with some special rare condition, illustrated by cases which have come under the care of Professor Pick. Admirable clinical notes, with post-mortems and microscopical observations, are given, the cases are illustrated by photographs and figures, and a complete record is thus furnished of a number of rare and interesting affections of great importance to our knowledge of human cerebral localisation. A review of cases recorded by other observers is given, and a short philosophical discussion of the subject is included.

It may be noted that a case of word-blindness in a left-handed person is recorded; at the autopsy was revealed softening of the right angular gyrus. This is of special importance, inasmuch as the two previous recorded cases were not convincing proof that the visual word centre of a left-handed person is in the right hemisphere; for Redlich's case was not in a left-handed person, and Bernheim's was supported clinically but not by autopsy. In fact, Brissaud states, "Traité de médecine," 1894, tome vi. p. 110: "If there is left hemiplegia at the same time as word blindness, it indicates bilateral lesion; for lesion of the left hemisphere is alone capable of producing word blindness." There is also a case of bilateral temporal lesion with subcortical sensory aphasia. A chapter on the relation of word blindness to agraphia is of interest; also another on partial disturbances of the auditory word centre and their relation to transcortical sensory aphasia, with illustrative cases. Conductive aphasia (Wernicke's *Leitungs Aphasie*) is illustrated by a case which supports the Breslau Professor's views. The patient suffered during life with paraphasia for spontaneous speech and an analogous condition for reading and writing; at the autopsy a lesion was found involving the posterior part of the left island of Reil, extending down to the claustrum and affecting the adjacent portion of the temporal lobe, thus severing the direct pathway between the auditory and motor speech centres. Some interesting cases of marked weakness of memory due to multiple brain lesions of vascular origin are given (probably syphilitic in nature). Two cases of tumour of the corpus callosum are recorded. Professor Pick agrees with the late Dr. Bristowe, that extensive tumours may occur without any definite cerebral phenomena beyond that of probable intracranial tumour. One of his cases had *early* choked disc; and post-mortem, marked distension of the lateral and third ventricles was found. The author points out that this does not support Bristowe's contention that optic neuritis was either late or did not occur. Passing to other parts of the nervous system, we find an interesting case of partial destruction of the interolivary layer in a tabetic general paralytic, with degeneration of internal arcuate fibres and fillet which was traced by Marchi method. Unfortunately no observations are made where these degenerated fillet fibres terminate. It would have been interesting to have seen whether any of these fibres entered the posterior part of the internal capsule to form the cortical fillet; as experiments made upon monkeys do not support this view, but show that the fillet teminates in the optic thalamus.

Hughlings Jackson, in the *Brit. Med. Journ.*, London, 1891, recorded a case of tabes in which the knee-jerk returned after an apoplectic attack followed by hemiplegia. Professor Pick records a similar interesting case of tabes, ending in general paralysis, with autopsy and microscopical examination of the cord. The knee-jerk was for a time absent, but after a number of epileptiform seizures, it returned. Since epileptiform seizures in general paralysis mean, as a rule, destruction of the cortical motor efferent neurons, no doubt this accounted for the return of the knee-jerks. The reviewer has met with one such case. In the case recorded by Professor Pick there was very little atrophy of the fine plexus of fibres around the cells of Clark's column, and Westphal's root zone was not extensively affected.

Chapter xx. deals with the different forms of tabes in children, and the author gives a case of Friedreich's disease with imbecility, which he had published in the *Zeitschrift f. Heilkunde*, 1891. Several similar cases have since been published by other authors.

The last chapters contain a collection of extremely rare and interesting cases of arrest of development and malformations of the spinal cord, including cases of teratoma and myelocyst of the spinal canal and heterotopia. There is also a chapter of considerable interest upon the fasciculus intermedius of Löwenthal, with remarks upon the anterior marginal bundle. Some very interesting illustrative cases are given, *e.g.* hydrocephalus adnatusenormis, one day old, with non-myelination of Lissauer's tracts, Goll's columns, and an area ventral to the cerebellar tract. In a normal child at birth these would have been myelinated.

The book is clearly written, admirably illustrated throughout, and contains a wealth of valuable and original observation and information upon a number of most interesting and important neurological subjects.

F. W. MOTT.

Annual Report of the Sanitary Commissioner with the Government of India for 1897. Calcutta. 1899.

IN comparing this report with those of the same series with which we were familiar some ten or fifteen years ago, we gladly recognise the improvements that have been introduced into them in recent years. We observe especially the attention which is now bestowed upon scientific work in its bearings upon the problems of disease in India. The volume before us, for example, gives excellent summaries of the more important bacteriological researches during the year 1897, in their relation to the etiology and prophylaxis of enteric fever and plague. Such a publication cannot be made light reading. It largely consists of densely marshalled masses of figures, exhibiting the sickness and mortality of the European and native troops, and of the prisoners, for the year 1897. The information it contains does not always lie on the surface, but has to be extracted from an analysis of the figures, and a patient comparison of tables and text. This is a labour for which few have time or patience. It may therefore be useful to notice, as briefly as possible, a few of the more interesting results gathered from a somewhat hurried examination of the volume. To begin with, we observe that the causation and prevention of enteric fever continues largely to absorb the attention of the Indian Sanitary Authorities. Nor need we wonder at the prominence given to this subject, for enteric fever is at the present day one of the most fatal diseases of the European soldier in India. The ratio of admissions in the European army of India for the year 1897 was 32·4, and the deaths 9·01 per 1000. Enteric fever accounted for no less than 39 per cent. of the deaths from all causes. When we remember that the death-rate of the troops at home from this disease does not, as a rule, exceed 0·20 per 1000, and that of the native army in India averages 0·12 per 1000, we realise that we have to face a problem deserving all the attention which can be bestowed upon it. The fact that the death-rate of the European is about seventy-five times higher than that of the native soldier, proves that it is not so much a question of the diffusion and intensity of the virus with which we have to deal, as of susceptibility. We may remark that the same difference in the susceptibility of the European, as compared with the native, is observed in Algeria, where the French army is said to be a hundred times more liable to the infection than the Arab contingents.

Another remarkable thing about enteric fever in India is its steady and continued increase during the last thirty years, notwithstanding the immense progress that has been made during that time in all sanitary matters. The barracks have been improved; continued efforts have been made to secure a pure water supply; more and more strict regulations have been made to insure the purity of the milk, and increased attention has been given to the comfort and well-being of the soldier; but all the while the disease has been steadily increasing in fatality, and the year 1897 stands out as the worst of the series. The ratio of enteric deaths, which was 2·03 per 1000 in 1870–79, rose to 3·79 in the decade 1881–90. In 1896 it stood at 6·31, and in 1897—the year with which the report deals—it reached, as we have said, the formidable figure of 9·01 per 1000. Besides the efforts made to obtain water from the purest available sources, resort has lately been had to filtration, boiling, and treatment with permanganate of potassium. The result of all these efforts is disheartening, and is perplexing to those who look upon the question as simply one of water or milk pollution. It is stated in this report that Mr. Hankin discovered Eberth's bacillus in water that had been boiled and passed through a Pasteur filter. The most disastrous outbreak of the year occurred at Agra, where the death-rate attained the truly appalling figure of 45·04, as against the average of 7·60 per mille. In this instance, we are told, a new water supply was introduced in 1894, and that during 1897 the water was first boiled and then treated with permanganate of potassium and hydrochloric acid, with the results just indicated. We may be quite sure that a microbe which is found in boiled, filtered, and permanganated water will be present in every article of food, in the air, and consequently in the mucous passages. It is probable that none escape its invasion.

As bearing upon the increase of enteric fever in India, it may be interesting to note the experiences of the French in Algeria. This is what Kelsch says: "The rarity of enteric fever in Algeria, from 1830 to 1840, forms one of the most striking facts in the Algerian pathology of that period." Afterwards: "Elle s'est manifestée peu à peu dans les colonnes expéditionnaires et dans les centres urbains. Puis, prenant de plus en plus d'importance dans ces derniers, elle a fini par devinir une des maladies les plus communes de la population civile et militaire de la colonie."

What is the cause of this great increase in India and Algeria? Certainly not increasing neglect of sanitary precautions; not a deteriorating water supply; not an increased diffusion of the virus. We think that the main cause is to be found in the larger number of soldiers of the most susceptible age which are sent out to India, and in the greater frequency with which the acclimatised are replaced by fresh relays of susceptible subjects. Whether this is a full explanation of the phenomenon, however, requires further examination. How is the mortality to be reduced? Less attention should not be paid to the pathogenic microbe, but more care should be given to the subject of its attacks. It is in the direction of increasing the resistance of the body to the infection, rather than in preventing the invasion of the body by the microbe, that our hopes for the future lie. It has still to be seen how far this can be accomplished by the use of vaccines. The latest figures of Dr. Wright's inoculations show the cases to be 9·5 and the deaths 1·8 per 1000 of those so treated—a result which surely justifies more extensive trials. In the meantime, the fact that in certain regions of India the disease is four times less prevalent and fatal than in others, suggests that the mortality might be considerably reduced by sending the troops fresh from Europe to these comparatively fever-free regions, until they become partially acclimatised, and then passing them on to the districts in which the disease is more prevalent. The plan adopted of sending the newcomers direct to the Hill Stations for acclimatisation ignores the fact that the incidence of enteric fever on these stations is greater than on any of the other geographical groups.

Influenza made its appearance in India in 1890, and still maintains its footing, just as it does at home. The native troops are nearly twice as liable to be attacked, and the mortality amongst them is eight times greater than among the Europeans. Here again the importance of susceptibility in relation to infection is manifest. This greater susceptibility of the native as compared with the European is in relation to the liabilities of the two races to respiratory diseases. The death-rate of the native troops from pneumonia is 3·02, that of the European army 0·62 per 1000. Influenza, in India, is a disease of the cold season, the minimum falling on October, the maximum on May. The microbe comports itself as if it belonged to the obligatory class of organisms.

The year 1897 was a famine year, and was preceded by a year of scarcity. It is interesting to observe, on a large scale, the effects of famine on the health of the population. In the Central Provinces the scarcity in 1896 was followed by a year of extraordinary misery. Here the birth-rate fell 10 per cent. below the average; the death-rate rose from 37 to 69 per mille. We read some time ago a good deal about the influence of nourishment in the determination of sex, but the normal proportion of male to female births in the Central Provinces was unaffected by the famine. The mortality from dysentery and diarrhœa rose to four times its normal figure; cholera was twice as fatal, and fever deaths mounted from an average of 23 to 50 per mille. The infantile mortality was enormous. The spread of smallpox was favoured in some localities by the movements of the population in connection with relief works, but it does not appear that the famine directly predisposed to the infection—a point of considerable importance in epidemiology.

Perhaps the most interesting of all the subjects dealt with in this report is plague. Many valuable observations are recorded respecting the modes in which the infection is transported from place to place, the way in which it becomes diffused in a locality into which it has been introduced, the social and climate conditions which favour its spread, and the effects of the measures adopted to limit its extension, and to combat it in infected localities. As the experiences of 1897 are becoming widened, and to some extent modified, by later observations, it would be out of place to attempt to discuss these subjects upon the basis of this report. One or two points of interest, not involving detail, and respecting which somewhat definite results have been attained, may be briefly noticed.

It is often said that plague is the only pestilence that naturally attacks the lower animals. This is not strictly true, for it has been ascertained that yellow fever is naturally infectious to certain animals, but it may be safely said that plague is the only pestilence in the spread of which the lower animals play an important part. It may perhaps be found that plague is not primarily a human disease, but one which originates in and is disseminated by certain species of the lower animals.

The animals which have been found subject to the natural infection in India are rats, mice, squirrels, and grey and brown monkeys. Cats and dogs appear, in some instances, to have died of the disease—but bacteriological proof of plague infection in these cases is still wanting. Although serpents are so common in India, we hear of no unusual mortality among them in infected localities. In China, on the other hand, they are said to become affected by feeding on diseased rats. In old books on plague, serpents are frequently referred to, not, indeed, as dying of the disease, but as heralds of its approach, forsaking their holes in the earth, "beand molestit," as Skene puts it, "be the vapore contenit within the bowells of the samin." It is not likely, however, that Scotland afforded an opportunity for Skene making original observations on this point, which still remains unsettled.

It is no new observation that rats are naturally subject to plague. In several of the contemporary accounts of the Black Death, mention is made, although incidentally, of the death of rats during the epidemy, and later writers attach great importance to an unusual mortality of rats as a sign of an approaching pestilence; but none of them seem to have suspected that they had anything to do with the propagation of the disease. This very important observation has been made for the first time during the present extension of the disease in the East. Numerous observations are recorded in this report illustrating the part they play in diffusing plague and in defining the limits within which they propagate the disease. We think they will be found the chief agents for transporting the infection across the ocean.

Pigs, goats, horses, cattle, and birds have been found to be immune to the infection. Giaxa and Gosia, however, have shown that pigeons become susceptible when starved. The accounts that have come down from the Middle Ages of cattle, sheep, and horses suffering from true plague, will be found, when carefully examined, to refer either to local epizootic outbreaks, or to the animals having been allowed to wander uncared for on account of the death of their owners.

One is struck, in reading old accounts of plague, with the constant mention of birds either falling dead in plague times, or deserting plague-stricken regions. Nothing of this has been observed in the recent outbreaks in the East. It has been noticed that in Bombay the vultures which prey on human bodies exposed on the Towers of Silence neither avoid plague bodies nor suffer from preying on them. It is stated in one report that they have quadrupled since the outbreak of plague. It will be remembered that Thucydides, in his account of the plague of Athens, the nature of which is uncertain, says that "all the birds and beasts that prey on human bodies, either did not come near them, or died after they had tasted them."

Considerable attention is devoted in the report to the agency of insects in carrying, preserving, and inoculating the virus. This much is proved, namely, that plague bacilli are ingested by fleas, flies, ants, bugs, and beetles, and that the bacillus retains its virulence for a considerable time in these insects. Fleas are suspected of inoculating the disease, and some experiments on animals, if not perfectly conclusive, seem to justify the suspicion. Indeed, a considerable number of Indian authorities are inclined to look upon fleas as the chief agents of infection in the case of man. Mosquitoes are absolved from all participation in the diffusion of the disease, on the ground that attendants on plague patients who are continually being bitten by mosquitoes that have been feeding on the sick, are so seldom attacked. But one is inclined to wonder how it is that the attendants so often escape if fleas are really the inoculators of the disease. The present state of our knowledge respecting the channels and agents of infection is thus summed up in the report: "In a certain small proportion of cases the bacillus enters by the lungs, but in India its entrance by the intestine has not yet been proved. In the majority of cases the bacillus appears to enter by the skin, but the mechanism of this entry has not been absolutely demonstrated. There is, however, sufficient suspicion attaching to the possible rôle of insects as not only to justify but to call for further research." We venture to remark that the extraordinary mortality in Bombay from respiratory diseases during the epidemy is not consistent with the view that it is only "in a certain small proportion of cases" that the bacillus enters by the lungs. The excess of respiratory diseases above the average must unquestionably be set down to plague, and if this is so, the pneumonic form will appear to have been almost as prevalent as the bubonic type, if not more so, at certain stages of the evolution of the epidemy. Recent researches by Batzaroff point to the infection of plague pneumonia as being mainly propagated by the breathing air.

The different races suffer unequally. The Hindoos furnish by far the largest proportion of victims. It is believed that this is partly the result of their being vegetarians. Flesh-eaters show a greater resistance to the infection. Little is said in the report respecting the influence of occupation on the liability to the disease. Dr. Weir, the Sanitary Commissioner for the City of Bombay, has drawn attention to the comparative immunity of the scavengers, who number above 2000 in all. The exemption of this class has often been noticed. Colle observed it during the Black Death, and tries to explain it. He says: "Coriarii, qui latrinas exportant, hi etiam, qui xenodochiis inserviunt et locis fœtore gravi molestis, omnes fere a peste immunes conspiciebantur; venenum enim venenis debellatur, arcetur et expellitur." Weir also notices the remarkable immunity of prostitutes in Bombay. This also has been observed in most outbreaks, from the earliest times. In the Plague of London it was lamented that "of all the common hackney prostitutes of Lutener's Lane, Dog Yard, Cross Lane, Baldwin Gardens, Hatton Gardens, and other places, there are but few missing." Weir ascribes their immunity in Bombay to the circumstance that, as a rule, these women inhabit a better class of houses than the common people.

Others think that the mercurial treatment, to which most of them have been subjected at one time or another, is the cause of their immunity.

The very important subject of prophylactic and curative inoculation is scarcely touched upon, as the subject was engaging the attention of a Special Commission when the report was compiled. It appears, however, from official statistics, that those treated with Haffkine's prophylactic vaccine are about six times less liable to be infected than those not so treated. The prophylactic value of this vaccine in individual cases and in small communities is proved; but its value as a practical means of dealing with epidemies on a large scale has still to be demonstrated. Its protective power is unfortunately of short duration. It is to be regretted that olive-oil inunctions as a protective have not been tried. The evidence given by Hæser in favour of this simple means of prevention is sufficiently strong to justify a trial.

Yersin treated fifty patients at Bombay with his curative serum. Of these thirty-three recovered and seventeen died—a case mortality of 34 per cent.—which contrasts favourably with the Bombay average of 82·6 per cent. for the year 1897. As the experience of 1360 years has proved how little is to be expected from the use of ordinary remedies in the treatment of plague, every effort should be made to improve the antitoxines and extend their use.

ANDREW DAVIDSON.

Allgemeine Therapie der Hautkrankheiten. Von Dr. P. G. UNNA, in Hamburg. Berlin u. Wien, Urban u. Schwarzenberg. 1899.

THERE is no existing treatise which deals with the general treatment of skin diseases in the manner in which it is handled by Unna in this suggestive work. It is the outcome, though scarcely the complement, of his elaborate histopathology of the skin. Induced by the minute investigations therein recorded, he here endeavours to allocate to the individual elements of the tissues, the particular action of special drugs, but in many cases our microscopical knowledge is still too rudimentary to enable this to be stated with accuracy. Still, were we to wait till this precision had been reached, much valuable information would have been withheld for the present. In placing before his readers an exact statement of the limitations of our knowledge, he has conferred an immense boon on dermatological study, for he has indicated lines on which it may be further pursued with advantage, shown the methods by which progress may be effected, and told us very clearly how science explains the successes heretofore obtained in a large measure by empiricism. In an introduction treating of the modes of application of remedies, many interesting points are considered. One of the most trenchant of these is the penetrative power of the vehicle, a quality which manufacturing chemists have placed in the forefront. Of this two facts are demonstrated—one that, while the corneous layer in health opposes an almost impenetrable barrier, when attacked and altered by disease, its porosity renders it perhaps too permeable, so that a penetrating medium is not in all cases the most suitable. The other, that the more perfectly the excipient itself absorbs the remedy, the less readily does it give it up to the skin. Hence vaseline, though not so freely absorbed by the integument as lanoline, is yet in certain cases preferable, since the combination between the drug and vaseline is less perfect than with lanoline. In dividing his subject he forms three groups, the first embracing those remedies which affect the skin in general rather than the included elements. The second takes in such as have an influence on the epidermis, with sub-sections dealing more particularly with the corneous layer, the prickle layer, and the appendages. The third is occupied with the treatment of the cutis and subcutaneous tissue. It is difficult to analyse the various sections under these heads briefly, for the complex necessities of each case have been so minutely and carefully regarded that any résumé is impossible. One finds certain remedies and groups of remedies cropping up in different places, since the action exerted by any one remedy is hardly positively elective. It may act in the main on one element or in a particular manner in one special set of conditions, while it also controls, if less markedly, other elements in circumstances which are totally distinct. Besides the suggestions for the use of applications, there are to be found, scattered copiously throughout, practical hints as to the treatment of individual maladies or morbid states, of the greatest value. Unna by no means despises, as so many Continental dermatologists have done, internal medication or dietetic rules. Indeed he has, in this work, added to the number of those few specifics which have been proved to have a reliable effect, while he has made the employment of those already known, more precise. The work is one which must be read and studied with care if any real benefit is to be derived from its perusal, and, as its author advises, Leistikow's *Therapie der Hautkrankheiten* should simultaneously be consulted for details of formulæ which are out of place in this more general treatise. We trust that ere long it will be accessible to those unacquainted with German, in an English version.

W. Allan Jamieson.

The Surgical Complications and Sequels of Typhoid Fever. By Prof. W. W. Keen, Philadelphia. London: The Rebman Publishing Co. 1898.

This is a work of reference dealing with a subject of which the literature is scattered throughout the medical journals of many countries. The author, assisted by Dr. Westcott, has tabulated and analysed no less than 1700 cases of typhoid fever which were attended with surgical complications.

After an introduction, indicating the origin and scope of the work, there is a good description of the pathology of the surgical complications of typhoid, dwelling on the peculiarities of Eberth's bacillus, its life-history, its pyogenic properties, and its association with other organisms. The next chapter, which is devoted to typhoid gangrene, is an amended version of the author's well-known Shattuck lecture, delivered before the Massachusetts Medical Society in 1896. The gangrene is attributed to an interference with the circulation of the affected part, in which an important part is played by the bacillus itself in assisting the coagulation of the blood; the gangrene may follow on arterial embolism of cardiac origin, or on thrombosis in the artery or in the vein, or on thrombosis in the peripheral vessels. The author's records embrace considerably over 100 cases of gangrene, most of them located in the lower extremity. The following chapters are devoted to the lesions in the bones and joints associated with typhoid fever, to typhoid abscesses and hæmatomata, to the cerebral complications, to otitis media, parotitis, affections of the thyroid, larynx, chest, œsophagus, stomach, intestine, liver, gall bladder, spleen, and sexual organs. The ophthalmic lesions are specially described by Professor de Schweinitz of Philadelphia.

As a monograph on the subject, the book is authoritative and satisfying, because it contains some reference to everything which has been written on the subject; at the same time it partakes somewhat of a disjointed compilation; the recorded observations are accumulated one after the other, rather than digested and assimilated; and the reader is left very much to make his own inferences and conclusions.

ALEXIS THOMSON.

Selected Papers on Stone, Prostate and other Urinary Disorders. By REGINALD HARRISON, F.R.C.S., Surgeon to St. Peter's Hospital. London: J. & A. Churchill. 1899.

CLINICAL essays by acknowledged masters are at the same time the most instructive and most interesting forms of medical literature. The present series of selected papers on urinary disorders, by Mr. Harrison, supports this contention. It includes the Bradshaw lecture on vesical stone and prostatic disorders, and other clinical lectures and addresses on the treatment of prostatic obstruction, on saccules and pouches of the bladder, on the treatment of chronic nephritis by incision of the kidney, on stricture of the urethra, on hæmaturia, etc. Although already published, and therefore familiar to most of our readers, it is a great convenience to have them gathered together in one volume.

ALEXIS THOMSON.

The Treatment of Lateral Curvature of the Spine. By BERNARD ROTH, F.R.C.S., Orthopædic Surgeon to the Royal Alexandra Hospital for Sick Children. Second Edition. London: H. K. Lewis. 1899.

THE first edition of Mr. Roth's work being out of print, he has taken the opportunity of re-writing and re-arranging it for issue in its present form, and of adding the further experience which he has gained since the first edition was published ten years ago. Although Mr. Roth's style borders here and there on the egotistical, he is deserving of great praise for the perseverance and ability with which he has developed the rational treatment of lateral curvature, and we heartily wish that his methods of treatment may be more widely known and adopted. The book is well and profusely illustrated.

ALEXIS THOMSON.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

SPLENIC ANÆMIA (Anæmia Splenica; Splenic Pseudo-leukæmia; Splenomegalie primitive; Lymphadénie splénique).

SINCE 1856, when Woillez published the first recorded case of undoubted splenic anæmia, up to a few years ago, comparatively little notice was taken of this condition. Recently, however, a number of observers have reported cases, and dealt with the etiology and symptoms of the disease.

Sippy (*Am. Journ. Med. Sc.*, Phila., October 8, 1899), reporting an instance of this somewhat rare disease, goes fully over the extant literature on the subject. His patient, a male, æt. 45, had never had malaria and had always been strong and healthy. Three and a half years before, he had noticed a swelling in the left hypochondrium; firm, painless; associated with diarrhœa, debility, and gastric disturbances. He lost flesh and strength gradually. When first seen he was very anæmic, his abdomen filled by a large firm mass, reaching close to the pubic bone, but with no enlarged lymphatic glands. His blood contained 1,740,000 red and 5214 white corpuscles per c.mm., with 30 per cent. of hæmoglobin. The different varieties of leucocytes were in the following proportions:—Polynuclear neutrophiles, 66·4 per cent.; eosinophiles, 0·8 per cent.; transitional forms, 3 per cent.; large mononuclear, 4 per cent.; lymphocytes, 25 per cent. The hæmoglobin sank later to 10 per cent. only.

Post-mortem the spleen was found to weigh 2350 grms. (5·17 lb.); the liver, 2800 grms. (6·172 lb.); some of the lymph glands were slightly enlarged, chiefly in their connective tissue elements; the bones were fragile, and contained dark red, soft marrow.

In discussing the etiology of this affection, Sippy propounds three questions and proceeds to answer them:—(1) Is the enlargement of the spleen due to the pernicious anæmia? if so, what causes the latter? (2) Do both arise from one cause? (3) Is the anæmia dependent upon the splenic changes? if so, what are these changes due to?

If the anæmia be primary it must be classed among the essential anæmias. In chlorosis the spleen is often sufficiently enlarged to be palpable, as also in simple pernicious anæmia; it sometimes increases in size in simple anæmia, secondary to other diseases, or even when artificially produced; but in these instances the enlargement is only a fractional part of that seen in pseudo-leukæmia. Again, in the last-mentioned disease, the splenic increase precedes the anæmia, so that it is hardly possible that the anæmia forms the primary cause. A common origin of the two chief symptoms is possibly the true solution, but at present is unsupported by any evidence. The last conjecture, that the splenic lesion is primary, the anæmia secondary, is strengthened by the antecedent enlargement of the spleen, and by the beneficial results which have followed total extirpation of the diseased organ.

Medicinal treatment can only be palliative; complete removal of the enlarged spleen appears to offer very favourable chances of cure. Of seven cases recorded, in which the disease present was in all probability anæmia splenica, and splenectomy was performed, five recovered, although in all the operation took place at a late stage of the illness. This proportion of recoveries is far above that recorded where leukæmia was present and splenectomy performed.

A case of splenic anæmia, complicated with diabetes mellitus, is reported by H. A. Hare in the *Journ. Am. Med. Assoc.*, December 30, 1899. An earlier note was published by Hare in 1897 on the same patient (*Med. News*, Phila., March 27, 1897), stating that his urine had been found from 1895 to 1897 to be normal, his spleen enormously enlarged, and his blood to contain a large excess in the proportion of lymphocytes, with a normal total number of leucocytes; lymphocytes, 84 per cent.; mononuclear cells, 4 per cent.; polynuclear cells, 8 per cent.; eosinophiles, 3 per cent. Red corpuscles from 1,000,000 to 2,800,000. In February 1898 examination of the blood gave 40 per cent. of hæmoglobin, 1,620,000 red corpuscles and 7000 white. The latter consisted of 17 per cent. small lymphocytes; 19 per cent. large lymphocytes; 58 per cent. polynuclear; 2 per cent. each of transitional, eosinophile, and myelocyte cells. In June 1898 his polymorpho-nuclear cells were 66 per cent.; his lymphocytes, 26 per cent.; eosinophiles, 4 per cent.; transitional cells, 2 per cent.; myelocytes, 2 per cent.; and in addition it was noted that there were poikilocytes, macrocytes, microcytes, normoblasts, and gigantoblasts. His hæmoglobin was 25 per cent.; his red cells 1,800,000, and the white ones 7000.

In the following November large quantities of sugar were found in his urine, of which he was reported to be passing about 10 quarts a day, with 30 grs. of sugar to the oz., or more than 1 lb. of sugar daily. Hare unluckily lost sight of his patient after this, but puts the case on record because of its rarity.

At the Congress for International Medicine held at Carlsbad last spring, Minkowski (*Wien. med. Bl.*, November 20, 1899) introduced the subject of leukæmia. He divided leukæmia into three varieties—(1) The common, true form; (2) an acute form; and (3) a chronic form, closely approaching in symptoms and signs the pseudo-leukæmic class indeed, following upon the latter in certain cases.

Löwit on the same occasion summed up his views, based upon several years' observation upon cases of leukæmia, as follows:—(1) In myeloanæmia the variety of white cell termed *Hæmamœba leukæmiæ magna* is found in the blood, forming spores like sporozoa. (2) In lymphæmia few parasites are to be found in the blood, but the *Hæmamœba leukæmiæ vivax* can be cultivated from the blood-opening organs after death. (3) In some cases both forms can be grown from these organs. (4) In the pseudo-leukæmia of infants and of adults, leucocyte-like hæmamœbæ are present in the blood and organs. (5) Some animals are capable of becoming infected with leukæmia. (6) Leukæmia can be inoculated from one animal to another. (7) The question as to the artificial cultivation of the hæmamœba is not yet settled.

In the subsequent discussion upon these two papers, several speakers threw doubt upon the correctness of Löwit's observations.

Osler (*Am. Journ. Med. Sc.*, Phila., January 1900) gives an account of fifteen cases of splenic anæmia, three of which previously formed the subject of a paper in this Journal (May 1899).

Analysis of the details of these cases furnishes the following particulars (see table, p. 278).

The most important points shown by Osler's series of cases are—the longer duration of the disease than has been previously allotted to it; the absence of pain or tenderness over the spleen; the frequent occurrence of profuse hæmatemesis, proceeding, according to Osler, from the local congestion of the spleen, not from any general vascular dyscrasia; the presence of melanoderma in several of the cases; the moderate degree of anæmia; attacks of diarrhœa; and the presence of ascites, apart from hepatic lesions.

In differential diagnosis, pernicious anæmia is divided from splenic anæmia by the high proportion of hæmoglobin, the altered red cells, and the normal or only slightly enlarged spleen. Splenic leucocythæmia may resemble it after treatment, if the leucocytosis disappear; but here the blood will contain myelocytes. Hodgkin's disease presents enlarged lymphatic glands; while the rare cases in which anæmia accompanies enlargement of both liver and spleen (Banti's disease) generally offer evidence of primary hepatic lesion.

Hayem (*Presse méd.*, Paris, 20th May 1899) contributes a further example of this condition, in the person of a male, æt. 36, with an unimportant personal history except for a consumption of 3 litres of wine a day, who, eight months before examination, had suffered from an attack of boils on his limbs, and two months after had observed swelling of his abdomen. He never suffered any pain from it. On admission into hospital he was emaciated; covered all over with the results of scratching; many of the lymphatic glands slightly enlarged, probably the result of absorption from lesions of the skin from this; the left side of the abdomen occupied by an enlarged spleen, which reached from a finger's-breadth below the nipple down into the pelvis. The liver was of normal size. The splenic tumour was not painful, even when palpated, although the presence of friction sounds over the lower half indicated that some perisplenitis existed. As a rule, when the spleen is enlarged, pain is experienced in the left flank, generally paroxysmal in character. The peritoneal cavity contained a small amount of fluid, and later a pleural effusion appeared. Uncontrollable

TABLE.

Case.	Sex.	Age.	Duration.	Hæmatemesis.	Hæmaglobin per Cent.	Blood Red Cells (Thousands).	No.	White Cells. Varieties Per Cent.[1] 1.	2.	3.	4.	5.	6.	Result.
1	M.	36	...	Frequent.	...	2,000	...	...	...	...	...	...	...	Death ; hæmatemesis.
2	F.	11	2 yrs.	Twice.	...	2,250	7,120	...	...	...	...	...	...	*In statu quo.*
3	M.	35	12 ,,	Frequent.	...	...	...	...	...	...	...	...	...	Death; hæmatemesis and malaria.
4	,,	32	10 ,,	,,	25	3,000	2,800	84·4	4·4	5·0	3·4	2·8	...	Recovery ; splenectomy.
5	,,	38	12 ,,	,,	30	4,000	6,500	73·0	10·0	12·0	3·0	2·0	...	*In statu quo.*
6	,,	20	2 ,,	Twice.	...	2,187	12,497	...	...	...	...	...	...	Improved.
7	,,	40	2 ,,	None.	55	4,816	5,000	...	...	...	...	...	...	No note.
8	F.	56	3 ,,	,,	60	3,600	3,000	66·0	25·0	7·0	2·0	1·0	...	Improved.
9	M.	58	6 ,,	,,	60	4,788	5,200	40·0	52·4	2·0	4·8	1·2	...	Death ; ascites.
10	,,	39	?	,,	45	4,128	2,800	...	...	...	...	...	...	Improved.
11	,,	57	7 ,,	,,	37	2,500	3,000	78·0	6·0	13·0	2·5	0·5	...	Death ; lithotomy.
12	,,	40	8 ,, ?	Twice.	45	4,208	4,000	65·6	15·0	12·6	3·3	3·3	...	Improved.
13	F.	44	3 mths.	None.	23	1,540	3,300	74·0	19·6	1·6	2·6	1·5	1·5	Rapid improvement.
14	M.	35	5 yrs.	,,	55	3,856	4,500	73·7	14·0	8·0	3·3	1·0	...	Improved.
15	,,	43	8 ,,	Four times.	45	4,270	2,500	80·3	8·0	4·0	2·0	5·0	6·0	Improved.
Means.	M. 12	39·4	7·2 yrs.	7	44·1	3,614	4,879	70·7	15·6	8·1	3·2	2·25	0·85	Four deaths.
	F. 3	37	1·75 ,,	1	41·5	2,463	4,473	70·0	22·3	4·3	2·3	1·25	0·75	No ,,
	Both Sexes, 15	38·9	5·94 ,,	8	43·6	3,367	4,785	70·55	17·1	7·35	2·97	2·03	0.83	Four ,,

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[1] 1. Polynuclear; 2. small mononuclear; and 3. large, mononuclear; 4. transitional; 5. eosinophile; 6. myelocyte cells.

vomiting set in, followed by death. The blood contained 3,720,000 red and 11,500 white corpuscles, indicating a condition of moderate anæmia and slight leucocytosis. Post-mortem, the spleen was found to weigh 2430 grms. (5·37 lb.), and to be 28 cms. long by 15 cms. wide—smaller dimensions than were calculated during life, owing probably to the diminution of blood pressure and of blood in it. On section, lymphomatous nodules were found in great number in its substance; similar growths being present in the mesentery, one of which compressed the bowel a little below the pylorus, and may have occasioned the vomiting noted above. No change in the bone marrow was found.

Bacteriological inoculations from the blood and organs were either sterile, or only afforded signs of non-pathogenic growth.

Hayem is tempted to regard his case as a variation from the ordinary splenic anæmia, in which only a simple hyperplasia of the organ can be established, because of the presence of lymphomata in the spleen, mesentery, and muscles, but is averse to complicating an as yet little understood subject by multiplying its subdivisions. (It is of some interest to note that Hayem's earlier description of this case is summarised in the medical abstract published in the this Journal for May 1898.—A. L. G.)

Maragliano (*Gaz. d. Osp.*, Genova, 1898, No. 70) and Marty (*Gaz. d. hôp.*, Paris, 1898, No. 34), who record cases diagnosed by a process of exclusion as splenic anæmia, also treat of this subject. The first-named observer locates the primary lesion in the spleen, and looks upon splenectomy as the only form of treatment yielding any good result.

Jawein (*Berl. klin. Wchnschr.*, 1898, No. 33) regards the presence of a large number of nucleated red blood corpuscles as a characteristic of anæmia splenica. Türk (*Wien. klin. Wchnschr.*, 1899, Bd. xii. S. 40) maintains that "pseudo-leukæmia" can no longer be classed as a distinct form of disease. Many cases included under this name have been sarcomatous or tubercular. The remainder may be termed lymphomatoses, subdivided according to their location. Other cases are described by Bignami (*Policlin.*, Roma, 1898, tomo v. p. 1) and Banti (*ibid.*, 1898, tomo v. p. 5). Janz (*Beitr. z. klin. Chir.*, Tübingen, 1899, Bd. xxiii. S. 2) gives the mortality after splenectomy in pseudoleukæmia as 57·5 per cent., in leukæmia as 91·4 per cent.

SURGERY.

UNDER THE CHARGE OF

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INTESTINAL OBSTRUCTION FROM CONGENITAL ANOMALY OF THE TRANSVERSE COLON.

HAUSMANN of Lenczyca reports the interesting case of a Russian soldier, æt. 22, who was taken ill with abdominal pain and constipation, followed by vomiting two days later. When admitted to the hospital on the third day, he stated that he had had four similar attacks, the last eight months before, from all of which he had recovered without medical treatment. The abdomen was found to be distended and sensitive; the bowels had not moved since the onset of the illness; vomiting was persistent, and afterwards became fæcal. On the sixth day the belly was opened in the middle line. There were no evidences of peritonitis; there projected from the wound a distended portion of intestine, which was recognised as the ascending colon; on tracing it upwards to the hepatic flexure, the distension was found to cease abruptly, the colon beyond being pale, collapsed, and cord-like. The cæcum and ascending colon were of a bluish brown colour, and were in a condition of paralytic distension; the small intestine was congested and distended, and its coils were so arranged that they surrounded the cæcum on either side and below. On further manipulation, it was found that the cæcum, ascending colon, and small intestine had a common mesentery.

On turning back the cæcum towards the right iliac fossa, the collapsed colon beyond the hepatic flexure filled with gas, and the obstruction appeared to have been relieved. The author believed it to depend on the transverse colon being devoid of mesentery and being fixed to the posterior abdominal wall, allowing of the freely movable cæcum and ascending colon undergoing rotation, with consequent kinking at the hepatic flexure and partial strangulation of the mesentery. It was impossible to replace the bowels which were protruding from the abdominal wound, until a stomach tube had been passed up the rectum, allowing of the escape of a quantity of gas and fæces. The chloroform anæsthesia lasted two hours. The patient died on the following day with symptoms of septic intoxication. Distinct evidences of septic peritonitis were found at the post-mortem examination. At the hepatic flexure, the colon was tough, contracted, and narrowed over an extent of 6 cms. On tracing the transverse colon towards the left, it was found to disappear suddenly beneath the third part of the duodenum, at the right side of the vertebral column; the duodenum was firmly fixed to the anterior wall of the colon. The transverse colon was completely devoid of mesentery; it was fixed to the posterior abdominal wall and crossed the spinal column at the level of the second lumbar vertebra.—*Centralbl. f. Chir.*, Leipzig, January 6, 1900.

EVENTRATION AND IRRIGATION IN DIFFUSE PERITONITIS.

THE following procedure has yielded good results in the surgical clinique at Frankfort. It is described by Friedrich Bode. A median laparotomy is performed after placing the patient in the Trendelenburg position. The whole contents of the peritoneal cavity are then extruded; during this procedure, they are liberally irrigated with hot saline solution. The bowels are received in compresses saturated with saline solution, and are prevented from cooling by splashing them with the same solution from time to time. It was observed that not only was there no collapse from the eventration, but the pulse, previously small and rapid, showed decided improvement, probably as a result of the removal of toxic products. The perforation of intestine or other lesion causing the purulent peritonitis is easily discovered in the extruded viscera, and is treated *secundum artem.* The empty belly cavity is irrigated systematically with large quantities of solution, special attention being paid to the surface of the liver, the neighbourhood of the spleen, and the various recesses of the pelvis. The fluid which remains at the dependent parts of the belly is carefully and gently soaked up with gauze. The next step is to return the extruded viscera; this procedure is also accompanied by abundant irrigation; the replacement of the bowels is surprisingly easy, for the usual result of the hot irrigation is to inaugurate, even during the operation, peristaltic movements and contractions, and a diminution of their distension. A coil of intestine is selected from about the centre of the abdomen, and drawn upon so as to put the mesentery on the stretch and enable the operator to select an area near its posterior attachment which is devoid of blood vessels; a hole is made in this area, and a large-sized drainage tube is passed through it; the ends of the tube are brought out, one on either side, through a small incision in the abdominal wall over the ascending and descending colon respectively. Additional drainage tubes are inserted through these lateral incisions; a fourth tube is passed from the median incision into the lowest part of the pouch of Douglas. In certain cases, further tubes may be employed to drain the region of the liver, stomach, or spleen. The belly cavity is then closed with sutures. Any air remaining in the peritoneum is expelled by further irrigation with salt solution, some of this being left in the belly. Before applying the dressings, the permeability of the main drainage tube should be tested once more by gently injecting salt solution through the opening, until it escapes at the other. When replaced in bed, the head end of the patient should be raised so as to favour the escape of fluids from the abdomen. The tubes are washed through with salt solution twice or thrice daily; this frequently excites peristaltic movements of the bowels, which may result in loose evacuations. After three or four days, the drainage tubes may be removed and replaced by smaller ones, and finally by strands of gauze. —*Centralbl. f. Chir.*, Leipzig, January 13, 1900.

The Evolution and Diagnosis of Cancer of the Kidney.

In a recent clinical lecture at the Necker Hospital, Professor Guyon reviewed the clinical features of three cases of carcinoma of the kidney, two in men aged respectively 70 and 51, the third in a woman æt. 35. The elder of the male patients suffered from intermittent hæmaturia, associated with renal colic and the passage of worm-like clots, a well-marked varicocele on the right side, and an enormous tumour in the right flank. The hæmaturia had developed without any cause fifteen years before, but had not been abundant or troublesome until recently. The diagnosis was easy. The general health was excellent. Operative interference was not recommended.

The younger of the male patients had become thin and pale; the hæmaturia, of nine months' duration, was abundant, and was attended with pain in the right side, and with the passage of worm-like clots. Palpation of the kidneys, on repeated occasions, yielded no information. Cystoscopic examination showed that the bladder was healthy, and that the urine escaping from the right ureter was tinged with blood.

Catheterisation of the left ureter gave the desired information, that the left kidney was in good working order. The right kidney was removed by Albarran; it was not increased in size; at its upper extremity there was a projecting tumour the size of an egg, soft and friable in consistence. There were no enlarged glands. He made an uneventful recovery.

In the female patient the first hæmaturia had shown itself five months before, had recurred at intervals, and had been accompanied by the passage of clots. She was markedly anæmic, and had lost strength. The bladder and urethral orifices were found to be normal, on cystoscopic examination. Palpation of the loins was negative on the left side; the right kidney was movable, and could be made to descend below the lower ribs; it was slightly enlarged, and its anterior surface appeared to be hard and irregular. There had never been any pain in the right side, but occasionally some pains in the left, which, however, were disregarded in the diagnosis, because they were ill-defined and did not coincide with the attacks of the hæmaturia. Catheterisation of the ureters yielded normal urine from both kidneys. The right kidney was exposed; it was enlarged, and presented a limited tumour at its upper extremity; it was removed, and the patient made an excellent recovery.

In commenting on these cases, Prof. Guyon corroborated the opinion already expressed by Roberts, that the progress of cancer in the kidney is more prolonged than that of cancer in other viscera. Guillet estimated the average duration at three and a half years; in an analysis of thirty-three cases, there were five in which life was prolonged from four to six years, and six cases for ten years and more. Excluding those met with in children, the same author estimates the duration of sarcoma of the kidney as longer still. Prof. Guyon has frequently observed cases of renal cancer in which life was prolonged beyond the average of three and a half years, and is therefore disinclined to recommend nephrectomy, especially in patients of advanced years, the subjects of a large tumour of the kidney. There is greater necessity for operative interference in the small, rapidly-growing tumours, attended with suffering and rapid deterioration of health, exemplified by the second and third cases recorded above. In their diagnosis more stress is to be laid on the hæmaturia, and on the demonstration of its source, than on the recognition of a palpable tumour in the loin. To wait for the development of the latter is to jeopardise the prospects of radical cure. The occurrence of pain (renal colic), which is present in the great majority of cases of renal carcinoma, is usually an accidental accompaniment of the hæmaturia. Catheterisation of the ureters is not only an essential factor in the diagnosis of lesions of the kidney, but is also to be regarded as the most reliable guide in deciding the question of nephrectomy; the functional condition of the opposite kidney must be known before undertaking the removal of the one which is the seat of cancer. In exceptional cases the diagnosis of carcinoma may not be completed until the organ is exposed by operation.—*Ann. d. mal. d. org. génito-urin.*, Paris, January 1900.

Multiple Gastro-Intestinal Operations on one Patient.

The following case is instructive as illustrating the relative advantages of different methods of performing gastro-enterostomy. A girl, æt. 20, consulted Professor Kehr in Halberstadt, on account of vomiting, pain, and loss of weight; apparently the result of gastric ulcer of long standing. The stomach was prolapsed and enormously dilated. A posterior gastro-enterostomy by von Hacker's method resulted in only temporary improvement, for the vomiting returned, and the vomited matter contained abundant bile in addition to altered food. Six weeks after the first operation the abdomen was again opened; the efferent limb of the jejunal loop was found to be compressed by the afferent limb, which was enormously distended; a communication (entero-enterostomy) was therefore made between the two limbs, with the assistance of a Murphy button. Again a temporary improvement, and again a relapse into the *status quo ante*. The patient attended another hospital, where an anterior gastro-enterostomy (Wölfler's method) was performed; the result was at first most encouraging, and she gained ten pounds in weight. A few months later she was as bad as ever, vomiting everything and losing weight rapidly, in spite of washing out the stomach and most careful regulation of the diet. A fourth laparotomy was then performed by Kehr, by means of a large rectangular flap, of which the vertical limb corresponded to the outer border of the right rectus and the horizontal limb was just above the umbilicus; on reflecting the flap he came upon a perfect chaos of adhesions. The colon was empty and collapsed, in spite of there having been no motion for ten days; the abdominal contents were like those of an individual who had died of malignant stricture of the gullet. The adhesions in the region of the stomach were separated with much difficulty. The stomach was moderately distended with fluid contents, and yet none of these could be expelled by compression into the bowel. To discover the actual condition of affairs, it was necessary to open the stomach by an incision between 4 or 5 in. in length. It was then found that the communication between the intestine and the anterior wall of the stomach was entirely obliterated. The posterior communication would only admit of the little finger. The pylorus was contracted to a similar degree. The operation having already lasted one hour, it was necessary to complete it as rapidly as possible. The efferent loop of intestine which had been employed in the anterior gastro-enterostomy being of no further use, was excised; its open lower end was stitched into the opening already made in the stomach, and the remainder of this opening closed with sutures. The afferent limb of the jejunum was made to communicate with that already fixed in the stomach, at a point 8 in. below its communication with the latter (Roux's Y-method of gastro-enterostomy). The entire operation lasted two hours. The patient made a very rapid recovery. The anastomosis functionated well. No bile was ever found in the stomach wash. The bowels moved regularly. Contrasting the various methods of gastro-enterostomy from the standpoint of this liability to be followed by regurgitation of intestinal contents into the stomach (circulus vitiosus), the author has found the posterior operation of von Hacker superior to the anterior method of

Wölfler, and the Y-method of Roux superior to either of them.—*München. med. Wchnschr.*, December 5, 1899.

TRANSPLANTATION OF TENDONS.

Lange of Munich, instead of connecting the tendons of a functionating muscle with that of one which is paralysed, prefers to attach the former to the periosteum at such a point as will insure the best functional results. In a boy, æt. 7, with paralysis of the extensor longus digitorum and both peronei, he attached the half of the tendon of the tibialis anticus to the periosteum of the cuboid. A similar operation was performed in a boy, æt. 13. In a girl, æt. 12, suffering from pes calcaneovalgus, from paralysis of the calf muscles and paresis of the tibialis anticus, he brought the peroneus longus behind the os calcis, and attached it to the periosteum immediately internal to the insertion of the tendo Achillis.—*Centralbl. f. Chir.*, Leipzig, December 2, 1899.

MALIGNANT TUMOURS OF THE PROSTATE.

R. Wolff has collected the recorded cases of malignant disease of the prostate, including four cases of carcinoma, which have come under his own observation. The total number of cases of sarcoma (twenty) indicates the rarity of the disease; it is mostly met with in childhood and in youth. The progress of the disease is rapid, and usually terminates fatally within twelve months of its onset. The tumour growth may project above the pubes or in the perineum, and frequently involves the wall of the bladder. The chief symptoms relate to difficulty of micturition. Operative interference is usually restricted to suprapubic cystotomy.

Carcinoma of the prostate is represented by sixty-seven cases; it is chiefly met with after middle life, fifty-three cases being observed between the ages of 50 and 90. The disease very commonly affects a prostate which is already the seat of innocent hypertrophy; there is progressive enlargement of the organ, which may present a smooth or nodular, or lobulated surface. The clinical features are so very like those of the innocent hypertrophy that the diagnosis is often mistaken. The form, size, and hard consistence of the prostate, on bimanual examination, may suggest the development of malignant disease, also the recognition of enlargement of the retro-peritoneal lymphatic glands. Sometimes there are sharp pains in the region of the prostate, resulting from retention of the secretion from obstruction of the ducts. Sometimes the distended follicles may be felt per rectum, and may be emptied by pressure into the urethra, from which there escapes a whitish or purulent-like, or blood stained discharge. The persistent or intermittent dripping of blood from the urethra may be the most prominent symptom of the disease. The passage of the catheter is often painful, and the patient is seldom able to bear having one tied in permanently. Very large tumours may project into the rectum, and give rise to symptoms of obstruction, for which colotomy has been performed. In a limited number of cases there is an entire absence of symptoms. The further growth of the cancer may involve the seminal vesicles and the wall of the bladder. Secondary growths are met with in the pelvic lymphatic glands and in the bones, more especially in the pelvis, in the spine, and in the femur. The diffuse or general dissemination throughout the skeleton has been described by von Recklinghausen as carcinomatous osteomalacia. Even after death the diagnosis between innocent enlargement and cancer of the prostate may be difficult, unless the microscope is had recourse to. Operative interference is usually out of the question. —*Deutsche Ztschr. f. Chir.*, Leipzig, Bd. liii.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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TRANSMISSION OF STREPTOCOCCUS FROM MOTHER TO FŒTUS.

BONNAIRE (*Soc. Obst. de Paris*, July 1899) reports two such cases. In the first the mother suffered from erysipelas at the fifth month of pregnancy. The membranes had been ruptured three days, and putrid liquor amnii was discharging. The fœtus was expressed, and died forty-eight hours later. Cultures of its blood showed the streptococcus only. In the second case, the mother gave birth to a dead child, and immediately after succumbed to cerebro-spinal meningitis. The autopsy showed pus over the cerebral and spinal meninges and exactly the same lesion in the fœtus. Cultures from both showed streptococci; cultures of the blood were negative.

AMNIOTIC INFECTION BEFORE RUPTURE OF THE MEMBRANES.

LEHMANN (*Obstétrique*, Paris, July 1899) reports a case of undoubted infection of the liquor amnii before rupture of the membranes. A thick and extremely fœtid fluid escaped as soon as they were artificially ruptured.

HÆMATO-SALPINX WITH PRIMARY TUBERCULOSIS OF FALLOPIAN TUBE.

THE patient, æt. 29, was seen in May of the present year, when she complained of pain in the right side, pain after passing water, and attendant irritation of the bladder. In other respects she was healthy. The constant pain rendered her more or less an invalid. The catamenia were regular. On examination, the uterus was small, there was a tumour of the right adnexa, the left were normal. Palliative treatment was adopted but without effect, and in June salpingo-oöphorectomy was performed. She made an excellent recovery, and her symptoms disappeared.

The outer half of the tube was enlarged and thickened, and the abdominal ostium closed by adhesions. The lumen was filled with blood and retained secretion. The microscope revealed an abundance of grey tubercles in the substance of the mucous membrane, the giant-cell systems being well developed. The muscular coat was not invaded, and there was no peritoneal lesion, which was probably accounted for by the fact that the tubercular condition was primary in the Fallopian tube.—MacNaughton Jones, *Brit. Gynæc. Journ.*, London, Nov. 1899.

RIGHT TUBAL PREGNANCY RUPTURED IN FIFTH MONTH; DELIVERY OF A LIVING CHILD FREE IN THE ABDOMEN BY CŒLIOTOMY IN THE EIGHTH MONTH.

TUBAL pregnancy was diagnosed at the third month, when the decidua were expelled. Rupture of the fœtal sac occurred without severe symptoms in the fifth month. In the eighth month secondary abdominal pregnancy was diagnosed, and laparotomy performed, when the fœtus was found lying free between the coils of intestine. The placenta was separated from its various attachments, and the patient recovered. On examination, it was found that the ovum had developed in the ampullary part of the tube; the whole length of the tube contained decidua, the author attributing this remarkable fact to the advanced stage of the pregnancy.—H. V. Both, *Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, Bd. ix. Heft 1.

PROLAPSE OF THE NORMALLY IMPLANTED PLACENTA.

THE author reports the following case. The patient, a multipara, was at full term. The midwife stated that the os had been fully dilated for two hours, but the head had made no advance into the pelvis. Abdominal palpation showed the uterus irregularly contracted, the fundus being hard and diminished in size. The head presented transversely and projected beyond the symphysis. The membranes were unruptured, and there was no escape of blood from the vulva. Soon after Haake's arrival the membranes ruptured spontaneously, followed immediately by the expulsion of the placenta and membranes, accompanied by considerable hæmorrhage. It was decided to empty the uterus immediately, and the child's head was perforated, and delivery completed with some difficulty, after which the hæmorrhage ceased. The previous history of the patient indicated the existence of a gonorrhœal endometritis.—Haake, *Arch. f. Gynæk.*, Berlin, Bd. lviii. Heft 3.

THE MISCHANCES OF OPERATIVE TREATMENT OF ABDOMINAL TUBERCULOSIS.

WUNDERLICH (*Arch. f. Gynæk.*, Berlin, 1899, Bd. lix. Heft 1) gives the results of the operative treatment of abdominal tuberculosis in Professor Doederlein's clinic at Tübingen. In seven out of ten cases, no cure was obtained, and the operation was directly injurious. In the other three, a favourable local and general condition resulted. He distinguishes three forms of tubercular peritonitis—(1) The ascitic, (2) the fibro-adhesive, and (3) the suppurative. In the first, the ascites recurred in 23·6 per cent. of all cases, and intestinal fistulæ were relatively common. In 344 cases, sixteen died immediately or within a few days of operation. In opening the abdomen in the dry adhesive form, the greatest care is necessary; two instances of injury to intestine are given, and fifteen of 136 patients died within a few days of operation. In the suppurative form the danger of operation is evident. Of twenty patients, nine died immediately or within a short time, three years at least, of laparotomy.

The author concludes that cure is most frequent in the ascitic form (about 23·3 per cent.), next in the adhesive form (about 9·8 per cent.). The results are remarkably discouraging; the curative influence of laparotomy has been much exaggerated. Operation may have a decidedly good effect, but is not the one safe and sure means of cure. Spontaneous recovery undoubtedly occurs.

VAGINAL CŒLIOTOMY, WITH REPORT OF ELEVEN CASES.

A. LAPTHORN SMITH (*Am. Journ. Obst.*, N.Y., July 1899) reports fully eleven cases, and draws the following conclusions as to the relative merits of and indications for vaginal cœliotomy:—(1) That it is indicated in retroversion with fixation, in minor diseases of the ovaries and tubes, and in small fibroid tumours of the uterus. This method of freeing the retroverted adherent uterus is more difficult than the abdominal, and vaginal fixation is not so reliable for cure as ventro-fixation. (2) If the uterus be movable, and there are no adhesions to be broken up, it is not justifiable to open the peritoneal cavity. In such cases, Alexander's operation is easy, quick, safe, and more reliable. The author has had no failures in his last 100 cases. (3) For the removal of pus tubes the operation by the vagina is more difficult than by the abdomen, in all cases excepting those in which the uterus is removed at the same time. When the uterus is split in half, and each half is removed with its corresponding ovary and tube, and when clamps are used, the vaginal operation is easier than the abdominal, in which ligatures are employed. The vaginal operation is a little safer on account of the drainage which it affords, but, on the other hand, it offers more risk of injuring the ureter. The author is, however, opposed to the removal of the uterus, even when both ovaries and tubes have been removed. (4) For the removal of chronically inflamed ovaries and tubes, vaginal cœliotomy has the following decided advantages: (*a*) It is less dangerous, because the intestines are not exposed to the air, or to bruising by the hands, or infection through diseased tissues passing over them, so much as when the latter are removed by the abdomen. (*b*) That it is less painful, the incision in the vagina causing almost no pain, while the abdominal incision and stitching are exceedingly painful. (*c*) There is no scar in the abdominal wall and no danger of hernia. (5) Much good conservative work on the ovaries and tubes, and even on the uterus, can be performed by vaginal cœliotomy, with almost no risk or pain to the patient. Cysts can be excised or burnt out; one-half of one ovary can be amputated, and the remaining flaps neatly brought together; the closed tubes can be opened, and salpingostomy performed; small fibroids can be enucleated. (6) Tubal pregnancy before rupture, and not later than the sixth or eighth week, can be readily removed by vaginal cœliotomy. But it is contra-indicated when the pregnancy has advanced to twelve weeks, or has ruptured into the abdomen. (7) In general terms, all cases in which the trouble is small in size and located low down, can and should be operated upon by vaginal cœliotomy, while everything large and located high up should be reserved for abdominal section.

THERAPEUTICS.

UNDER THE CHARGE OF

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IODINE AND THE THYROID GLAND.

Gautier publishes a communication on this subject (*Rev. méd. de la Suisse Rom.*, Genève, 1899), in which he relates a few of his own personal experiences in practice. A woman, æt. 50, the subject of a soft goitre about the size of an orange, had taken small doses of potassium iodide to reduce it. She at once began to emaciate, became absolutely sleepless, and very nervous. She had the typical facies of exophthalmic goitre, and this had come on during the preceding few days. The goitre had diminished in size only very slightly. The pulse was very rapid, tremors extreme, with permanent dyspnœa exaggerated on exertion. The treatment consisted in complete rest and small doses of ergotin, and at the end of six weeks there was marked improvement in all the symptoms. Some months later the goitre was removed by a surgeon, and she died a few hours after the operation without any symptoms beyond extreme rapidity of the pulse (140–160) and excessive dyspnœa. The autopsy showed all the organs to be healthy. The cause of death, according to Gautier, was thyroid poisoning, a quantity of the secretion having been expressed into the circulation by the surgical manipulations.

He says that slight unrecognised goitres are very common in Geneva. In women it is very often accompanied by more or less atrophy of the mammæ, and in such cases the administration of the minutest amounts of iodine may stop the secretion of milk during nursing.

In two cases of goitre Gautier has seen thyroid poisoning ensue after the application of iodine dressing to a tooth by a dentist. He also states that the small amount of iodine ingested during a holiday at the seaside may bring on symptoms. Nevertheless iodine, administered with prudence, is the best remedy for goitre. Small doses of potassium iodide is the best form in which to give it, and preferable to preparations of the thyroid gland. Two grs. once daily is a sufficient dose, and it can be stopped on the first symptoms of thyroidism. Goitrous children stand the treatment better than adults. Many cases show no signs of thyroid poisoning during the treatment.

DIETETIC DIFFERENCE BETWEEN RED AND WHITE MEAT.

OFFER and Rosenquist have published a long research on this subject (*Berl. klin. Wchnschr.*, 1899). They state that in ordering a dietary, the physician, with increasing frequency, forbids red meats. This dates back to Sydenham, who was in the habit of allowing his gout cases to eat the white flesh of fish, fowls, and calves, while forbidding the dark flesh of oxen, etc., as the latter encouraged the development of the disease. Later, it has been distinctly stated that dark meats increase the formation of uric acid much more than white meats. Gradually the same distinction came to be made in cases of chronic nephritis, and lately it has extended to gastro-intestinal diseases, rheumatism, and functional nervous diseases. The explanation given for the practice is that dark-coloured flesh contains a larger quantity of nitrogenous extractives (kreatin, xanthin, etc.), which irritate the kidney, and if not excreted act as poisons. The present research is concerned with determining the amount of nitrogenous extractives in the flesh of different animals. It was found that in all kinds the amount did not vary much—pike, ox-flesh, ham, cod, veal, mutton, fowl, venison, yielded from 0·4 to 0·5 per cent. Occasionally it was under 0·4, and they all varied somewhat with different samples. The conclusion come to is, that there is no practical difference in the amounts present. The total nitrogen varied more. Above 0·5 per cent. were shredded ox-flesh and raw ham; between 0·4 and 0·3, fillet of beef, roast beef, fowl, veal, mutton, and pork; the white meats were usually between 0·3 and 0·2 per cent., or rather less, but venison was also very low. The great majority of all kinds varied between 0·2 and 0·4 per cent. These are also of no practical dietetic importance, as it is doubtful if such slight differences, either in the extractives or total nitrogen, have any therapeutical consequences. Hence there is no basis for the distinction which is so commonly made between different kinds of animal food, except as regards their comparative digestibility.

Senator has criticised these results (*Berl. klin. Wchnschr.*, 1899) in the sense that the conclusions are not justified. The authors have paid no attention to the non-nitrogenous extractives, and these may have some influence, as, according to certain observations of König, ox-flesh contains 0·46 per cent. as against 0·07 per cent. in veal. Secondly, they analysed the various meats raw instead of cooked, which makes a considerable difference in the quantity of extractives, for roasted beef contains 0·72 per cent., and boiled beef 0·40 per cent., while roasted veal contains only 0·03 per cent. Reckoned as dried substance, roasted beef gives 1·59 per cent. extractives, and roasted veal only 0·09 per cent. Further, it is quite possible that the differences between dark and light meats do not depend on their respective richness in nitrogenous bodies. He holds that clinical experience is strongly on the side of the distinction commonly made, especially in gout and nephritis.

YEAST AND FURUNCULOSIS.

RECENTLY Brocq has revived the use of beer yeast in the treatment of boils, but he pointed out that its curative action was very uncertain, and that this depended on the special sample of yeast. Couturieux (*Presse méd.*, Paris, 1899) has obtained by cultivation a yeast which gives a constant therapeutical action, and from it an impure product which he terms levurin. It can be used dry or as a paste, and contains the active principle. Aragon (*ibid.*) has obtained good results with levurin on himself, and in other cases. The dose is one to two teaspoonfuls.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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ON THE ETIOLOGY AND PATHOLOGY OF THE KEDANI DISEASE.

THIS disease, restricted as it is to certain parts of Japan, has hardly yet been heard of in Western countries. Dr. Tanaka made his first observations on the disease about seven years ago, and called it a peculiar form of malaria. He has continued to work at it, and in the *Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 28th Oct. 1899, Bd. xxvi. S. 437, he adds a much more complete contribution to its pathology. Its onset is sudden, being generally ushered in by a chill, followed by an abrupt rise of temperature. In a few days the patient is severely ill, and an eruption appears on the third to seventh day. Its resemblance to the exanthemata is thus obvious. The type of rash is urticarial, with swelling of the lymphatic glands, redness of the face, and congestion of the conjunctiva. The tongue becomes rapidly dry, and there is a gradually developed anorexia and constipation. The pulse and respiration are both accelerated, and there is generally a well-marked acute bronchitis. Acute nephritis follows, and death generally supervenes (in from 40 to 70 per cent.) in ten to thirteen days. Tanaka has found that the disease is associated with a minute moth, which is widely prevalent in the affected region. It bites like the mosquito, and makes a small punctured wound in the skin, and thus probably infects the victim. He has found a bacillus, a proteus, resembling the *Proteous hanseri*, which he regards as the true causal agent. He has failed to find any plasmodium, and gives, with illustrations, a full account of the biological characters of the bacillus, which he considers to be the true cause of the disease, it being introduced by the moth in question, after the manner of the plasmodium malaria, by the bite of certain species of mosquito.

ACUTE ENDOCARDITIS.

1. *Due to the influenza bacillus.*—The number of organisms held to be responsible for endocarditic conditions increases as time passes, and there is nothing inherently improbable in the production of an apparently similar inflammatory condition in the heart valves, or elsewhere, by widely different organisms. To the staphylococci and streptococci, which are still most frequently found, have to be added the pneumococci, the

gonococci, the typhoid, tubercle, anthrax bacilli, and now apparently also the influenza bacillus. The pyogenic and even necrotic power possessed by the last-named has been not infrequently demonstrated in the lungs, and we are thus the more ready to accept that it can exert a similar power upon the heart valves. Endocarditis, indeed, ought not to be looked upon as a specific disease. It is but one of the local manifestations of some more general disease, sometimes very severe, and sometimes so slight as to escape notice. In itself it is but of little importance, except in so far as it leads to interference with the equilibrium of the heart's mechanism. In the simple warty form this comes in time to be all-important, except when emboli follow, the general mischief being slight, or apparently having long since disappeared, whereas in the so-called ulcerative form the general mischief remains, and continues to be the all-important factor. In valuable articles on the influenza heart by Saundby and others, references to the general effects of the poison on the heart have been made, but Austin has brought forward three cases (*Johns Hopkins Hosp. Bull.*, Baltimore, 1899, p. 194) in which endocarditis was present, and in which the influenza bacillus was found in the vegetations. All three cases showed a recent acute endocarditis (in two of them ulcerative), superimposed upon an old chronic valvular mischief. The influenza bacillus, free and within leucocytes, was found both in cover-glass preparations and in sections made from the vegetations. Attempts to cultivate the organism artificially failed, as they so often have in cases of bacteria found in vegetations, but otherwise it presented all the morphological and staining reactions characteristic of the influenza bacillus.

2. *Due to a new organism, Micrococcus zymogenes.*—At p. 46 of the same bulletin, a preliminary communication of a case of acute endocarditis, due to a new organism, was given by M'Callum and Hastings. They have now (*Journ. Exper. Med.*, N. Y., 1899, vol. iv. p. 521) given a much more complete account of this case, with a description of the morphological and biological characters of a new organism, which they have named *Micrococcus zymogenes*, and which they regard as the cause of the endocarditis. This lesion was acute in character, and involved both the aortic and the mitral valves, and there were also infarctions in the spleen and kidneys. The specific micrococcus was isolated in pure culture from the blood during life on two occasions, once nine days, and the other time three days, before death; and was further demonstrated after death, both microscopically and in pure culture, in the valvular vegetations, the infarctions, and other parts. No other species of microorganism was found. It is very small, occurs mainly in pairs, sometimes in short chains, stains by Gram's method, grows in small, pale, greyish white colonies on gelatine and agar, at first clouds bouillon, which then becomes clear with a whitish sediment, does not produce gas in glucose media, liquefies gelatine slowly, and acidifies, coagulates, and subsequently liquefies milk. The behaviour in regard to milk is especially characteristic. It produces a milk-curdling ferment, and also a proteolytic ferment. It remains viable for months, and has considerable powers of resistance to heat and antiseptics. It is pathogenic for mice, rabbits, and some dogs. In a footnote the authors add that Dr. Harris, in the Pathological Laboratory of the Johns Hopkins University and Hospital,

isolated in May 1898, from material removed from an old cesspool in Baltimore, which had not been evacuated for twenty-two years, a micrococcus which so closely resembled theirs in morphological and structural characters, that they were inclined to regard it as the same, though they had not been able to test its pathogenic properties.

ON THE VALUE OF BLOOD EXAMINATIONS IN DISEASE.

1. *Leucocytosis in cases of pus formation anywhere in the body.*—Maclean (*Med. News*, N. Y., Dec. 2, 1899, p. 715) has contributed a paper which shows the great value which an examination of the blood possesses, from the diagnostic standpoint. He refers first to the physiological leucocytosis which occurs after a meal, and recommends that all blood examinations should be made preferably before breakfast. Pathological leucocytosis is generally in excess of any form of physiological leucocytosis, and the latter can generally be easily eliminated. Leucocytes are present normally in the peripheral circulation in the proportion of 6 to 9000 per c.c.; and, as the result of a large number of blood counts made in cases of suppuration, he states that "in all cases of inflammatory disturbance, accompanied by pus formation, leucocytosis is an invariable accompaniment, except in a few instances." The suppurative process may be acute or chronic, deep-seated or superficial, encapsulated or diffuse, but the leucocytosis is present. The leucocytosis begins with the formation of pus and increases with it, but its degree is not always proportionate to the amount of pus present. The latter is probably to be explained if we look upon the leucocytosis as due not so much to the mere presence of pus, as to the resisting power of the patient. He records a number of cases in which the blood count helped to clear up the diagnosis in a wonderful manner. Some examples may be given. *Appendicitis.*—In the catarrhal form there is little or no increase, but in the purulent and gangrenous forms there is always an increase. The advance of a case from the former to the latter may thus be detected, and shows when surgical interference should be adopted. In one case, that of a male adult, the leucocytes numbered 19,600 at first count. Twenty-four hours later, temperature, pulse, and general condition better; leucocytes 22,000. Next day symptoms still improving; leucocytes 27,000. An immediate operation was urged, as, notwithstanding the improving symptoms, the increasing leucocytosis showed that the abscess was increasing in size. On operating, the appendix was found to be gangrenous in an abscess cavity, containing 9 oz. of pus. In other five cases of appendicitis three gave leucocyte counts of 31,200, 34,000, and 16,000, and were found on operation to be purulent; and two gave counts of 9600 and 7400 respectively; and in the former an operation disclosed a healthy appendix, surrounded and bound down by many adhesions, and the latter a healthy appendix but impacted gall stones. The blood count is therefore an important means of differential diagnosis, as it serves to distinguish appendicitis from many conditions which resemble it clinically, such as hepatic or renal colic, intestinal colic, intestinal obstruction (without gangrene), fæcal impaction, typhoid fever, nephralgia, floating kidney, ovaralgia, old adhesions, and tubercular peritonitis,

which all fail to give any leucocytosis. *Tuberculosis.*—In pure tubercular lesions, whether accompanied by pus formation or not, there is no leucocytosis. Thus, in a case of peritonitis in a child, tuberculosis was expected. The blood count gave 19,300 leucocytes, and thereby excluded tuberculosis. In another case of enlarged cervical gland, with fluctuation, the leucocytes numbered 6200, and showed it to be a tubercular abscess. Other instances of its application are given. Thus, in a case regarded as muscular rheumatism, the leucocytes numbered 20,600, and led to a suspicion of osteomyelitis, confirmed by operation. In a case with symptoms of obstruction of the gall bladder they numbered 14,000, and an operation showed an empyema with impacted gall stones. In another case of suspected abscess of liver they numbered 17,200, and an operation found a large abscess in the right lobe. In another case, thought to be appendicitis, in which an operation was advised by a consultant, they numbered 6800, and excluded appendicitis, but suggested typhoid, which was confirmed by Widal's test. Salpingitis and perinephric abscess were revealed in the same way, and its wide application is obvious. In that very important class of cases in which obscure and deep-seated formations of pus occur beneath the diaphragm, subphrenic abscesses, the test, if proved to be always reliable, will be of great service. It is of service also in diagnosing internal hæmorrhage. It is often difficult to say whether a case is one of concussion or compression from hæmorrhage; in the former there is no leucocytosis, whereas it is present in the latter. It appears within an hour or so after hæmorrhage has occurred, and persists for days, sometimes weeks. He gives a case of a male who was injured by being thrown from his horse. The question lay between concussion or cerebral hæmorrhage. Leucocytes were 9100 and red cells 4,700,000, and hence a diagnosis of concussion was made which proved correct.

2. *In the diagnosis of camp fevers.*—Dr. Curry, of the United States Army (*Boston Med. and S. Journ.*, Nov. 23, 1899, p. 513) refers to the great importance of the use of Widal's test in all cases of fever occurring in camp, especially in the early cases. His experience shows that generally early cases of typhoid are mistaken for malaria, and the true nature of the disease is not recognised until it has become almost epidemic and beyond control. The great prevalence of this disease among our troops in Ladysmith during the present war increases our interest in this subject. Curry states that, if the first cases are recognised, the disease can be stamped out. If one case of typhoid fever occurs in a command, and is followed by another, then is the time to act to prevent an epidemic. He made it a routine practice to take a specimen of fresh blood, at the same time as he took some for Widal's test. He made something over 1000 Widal tests, and fully as many examinations of fresh blood for malaria and for leucocytosis. He is of opinion that dried blood on slides is as good as the serum method for the carrying out of Widal's test, and states that he never once obtained a reaction by this method, that did not also give it with a dilution of at least 1 to 30 by the fluid serum method.

PHYSIOLOGY.

UNDER THE CHARGE OF

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The Amount of Glucose in the Blood.

The amount and form of combination in which the glucose exists in the blood have always been subjects for discussion, and at the present time even the most diverse views are held as to such fundamental points as the rôle of the liver in the metabolism of glucose. A paper by Bing in a recent number of the *Skandin. Arch. f. Physiol.*, Leipzig, Bd. ix. S. 336, deals mainly with the ether soluble reducing substances of the blood, regarding these as equivalent with the jecorin of Drechsel, while those reducing bodies which are soluble in water are regarded as glucose. The author removed the proteids from the blood by collecting the latter in 96 per cent. alcohol (30 c.c. of blood in 300 c.c. of alcohol). When glucose was injected into the blood, or added to blood serum in the test tube, it was gradually transformed to a large extent into jecorin. It is just possible that jecorin, in some cases at least, is a laboratory product, the combination between lecithin and glucose only arising in alcoholic solution and not in such a saline fluid as the blood. The author found that lævulose, galactose, arabinose, saccharose, and maltose could also combine with lecithin in alcoholic solution, while the dextrins could not. The amount of carbohydrate which could combine with lecithin varied tremendously, one molecule of the latter combining with 0·48 to 5·5 molecules of the former. After puncture of the floor of the fourth ventricle, there was a distinct increase in the amount of jecorin, but not of the water soluble reducing substances—glucose, or, more correctly stated, an increase in the latter was by no means constant. Removal of the pancreas caused an increase of both in the blood, but Bing was never able to obtain either soluble reducing substances from the urine in this or any other condition. After phloridzin there was no constant relationship between the two substances. Unlike Seegen, the author found no distinctly larger amount of glucose in the hepatic vein than in the portal blood, and, after feeding animals with carbohydrate, the amount of sugar in the blood of the portal vein was not greater than in the general arterial blood. The author does not deny but rather believes in the likelihood of glucose being formed in and given off from the liver, but he holds that the amounts so formed and poured out are so small at any one time that it is impossible by analysis of the blood to detect distinct variations. He believes that Seegen's results are due to the fact that he produced congestion of the hepatic circulation, and this he regards as proved from some experiments that he has performed on artificial congestion of the vessels in the liver. The jecorin which is found in the yolk of egg is not only precipitated by alcohol out of an ethereal solution, but also by ether out of an alcoholic one. It is not directly soluble in water, but passes into myelin forms, which gradually become dissolved by water under certain conditions. Seegen (*Centralbl. f. Physiol.*, Leipzig u. Wien, Bd. xiii. S. 593) replies to Bing's criticisms by asserting that, in the experiments of the latter on the amount of sugar in the portal and hepatic veins, there is a great deal to support the view that glucose is formed, and in appreciable quantities, in the liver, passing out in the blood of the hepatic vein. He holds that the principal objection which Bing makes to his experiments, namely, congestion of the portal circulation, is not a valid one. In order to understand the positions held by the two authors, it is necessary to describe shortly the procedure adopted by Bing for the removal of the blood for analysis. The portal blood was collected in the usual way by means of a catheter passed into one of the larger splenic veins and then into the trunk of the portal. To obtain the blood from the hepatic vein the following method was adopted in the first series of experiments. Into one femoral vein there was passed an elastic catheter, at the point of which there was fixed a balloon of thin caoutchouc. Then a thin straight glass tube was introduced through the right jugular vein and the right auricle into the inferior vena cava, until it reached the level of the entrance of the hepatic vein. The catheter which had been placed in the femoral vein was then pushed up until the point was just above the entrance of the renal veins, and the balloon arrangement was blown up. Now 80 c.c. of blood were removed from the glass tube in the jugular vein and analysed. Four analyses were made, and the amounts of sugar in the portal and hepatic veins were found to be almost identical, any variation lying within the limits of the experimental error.

In the second series of experiments Bing adopted Seegen's method, with the one exception that the simple cannula was introduced into the femoral, and the double-way cannula, from which the blood was taken, into the jugular. By this method he carried out two series of experiments. In the first set carotid blood was compared with that of the hepatic vein; in the second one the latter was compared with the portal blood. At each experiment two specimens of blood were removed, one before and the other a few minutes after blowing up the balloon arrangement on the double-way cannula. The results obtained were as follows:—

SERIES I.

	A.	*B.*
Carotid artery	0·079	0·094
Hepatic vein	0·095	0·142

SERIES II.

	A.	*B.*
Portal vein	0·122	0·127
Hepatic vein	0·183	0·488

A = before, *B* = after blocking the inferior cava above the entrance of the hepatic vein.

According to Bing, the blood taken before occlusion was obtained under physiological conditions, while after the blocking the blood was under abnormal conditions, owing to the congestion set up. According to Seegen, on the other hand, the facts are correct, but the interpretation is wrong. In the experiments of the first series, it is not pure hepatic vein blood that is collected, but mixed blood, probably mainly from the right auricle and superior cava; while in the experiments of the second series, and especially those after occlusion, pure hepatic venous blood is compared with that of the portal vein or carotid artery. According to the latter author, in the first series blood is withdrawn by aspiration from the thin glass tube passed through the jugular, and, as a result of this, blood from the right auricle and superior cava is sucked inwards. In the second series the lumen of the inferior cava was almost occluded by the double way cannula, even before the distension of the balloon, and so entrance of blood from the right side of the heart was at least greatly diminished, with the result that the blood taken for analysis was almost pure hepatic venous blood. After occlusion by the balloon arrangement, absolutely unmixed blood from the hepatic vein was obtained, and hence the larger amount of glucose. According to Seegen, the amount of glucose is rather too high, owing to the fact that the blood was not withdrawn until four minutes after occlusion. This rise in the amount of sugar is due, according to this author, to increased saturation of the hepatic venous blood with glucose, owing to the hindrance to the outflow of the blood. Seegen refers at some length to experiments which he conducted by means of a model designed by von Basch, to prove the action of the negative intrathoracic pressure, drawing blood from the superior into the inferior cava. Finally, Seegen refers to Bing's work on jecorin, stating that the results of the latter are quite opposed to his own ones. He says that the reducing substances which he obtained from the blood must be glucose, because it had the same reducing power, and also gave the same results on estimating by the fermentation method. It also had the same rotatory power, and gave the same ozazone with phenylhydrazin.

REDUCING SUBSTANCES IN URINE.

ROSIN (*München. med. Wchnschr.*, Bd. xlvi. S. 1456) describes a method for estimating the reducing power of the urine, blood, and other fluids, depending upon the reduction of methylene-blue, which is used as an indicator. Twenty-five c.c. of diluted urine (1 in 6), 1 c.c. caustic potash solution, and about 88 c.c. of liquid paraffin are poured into a flask of about 200 c.c. capacity, and the mixture gradually heated almost to boiling point. Into this fluid 1 c.c. of a methylene-blue solution (1 in 3000) is dropped, the temperature being still kept up. After a few seconds the blue colour disappears, and then $\frac{N}{100}$ permanganate solution is dropped into the warm mixture until a tinge of methylene-blue appears. From the amount of permanganate taken, one calculates the amount of oxygen used up, and this represents the reducing power of the fluid. The oxidation of the reduced methylene-blue only occurs after the reducing substances of the fluid have been oxidised. The small amount of methylene-blue only acts as an indicator. As is well known, almost identical methods have been employed before. The method has not yet been properly tried, and hence it will be necessary, before coming to a definite opinion as to its value, to give it a more prolonged trial.

DISEASES OF THE EYE

UNDER THE CHARGE OF

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ASSISTANT OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY.

OPHTHALMOSCOPIC CHANGES IN THE COMPLICATIONS OF EAR DISEASE.

WHEN the various intracranial complications of ear disease threaten, which are—pus formation extradurally, septic thrombosis of the sigmoid sinus, meningitis, cerebellar abscess, and cerebral (usually temporo-sphenoidal) abscess, an ophthalmoscopic examination is of great value in assisting to fix the diagnosis. The morbid appearance in the fundus may vary from simple hyperæmia to severe optic neuritis, and it can never be too emphatically stated that the absence of visual symptoms does not negative any of them: even well-developed optic neuritis may be present without the patient being conscious of any failure in vision. It is this fact that is largely responsible for the neglect—all too frequent—on the part of the medical attendant to have the eyes examined early: he is apt to think that because the patient can see quite well nothing can be going far wrong. There cannot be a greater delusion. The ocular manifestations reach their maximum importance probably in those cases of extradural pus formation, because it is of vast importance that such should be diagnosed before intradural invasion has occurred; immediate treatment in such circumstances may be looked upon as nearly certain to prevent some of the worst of complications, which are sure to threaten if interference is not swift and active. In some of these cases the diagnosis is a little doubtful, and the surgeon is apt to feel some hesitation as to whether operation is urgently called for or not: Gradenigo's view is one with which most practical men will agree—In such circumstances, if optic neuritis is present, proceed at once. The optic neuritis which occurs along with the intracranial complications of ear disease is almost always bilateral, though it is sometimes most marked on the side of the original ear mischief, and the improvement in the fundal appearances, the diminution of congestion, the absorption of exudations, etc., forms a very safe guide as to the condition of the deeper seated parts. While the presence, however, of an optic neuritis must be taken as indicating, practically with certainty, that the morbid process is no longer limited to extracranial structures, its absence must not be considered to indicate the contrary: it is not a pathognomonic sign. What the special feature in any given case is which determines whether optic neuritis shall or shall not be present, we cannot yet say: two cases may appear to us exactly alike in every essential, yet one will show no ophthalmoscopic signs, while the other does. Probably, besides the size and precise situation of the pus collection, and various other considerations regarding which we have now a good deal of information, there are other factors yet of which we know less,—such, for example, as the virulence of the infection, and the structure in the individual patient of the peripheral portion of the optic nerve. Gradenigo thinks we shall not be far amiss if we take it that ophthalmoscopic manifestations exist in about one-half of the cases of intracranial lesion following ear disease; it is obvious that the neuritis gives no information as to the precise locality or even the nature of such lesion.—*Ann. di ottal.*, 1899, tomo iii.–iv.

THE PERMANENT RESULT OF IRIDECTOMY IN GLAUCOMA.

ON this subject one can never have too many statistics, because, though no one now doubts the immense immediate benefit of iridectomy, at least in the acuter varieties of glaucoma, yet it is difficult to arrive at any very certain estimate as to what duration of time vision will last. What eventually becomes of our cases of glaucoma is a question which cannot fail to impress itself on every surgeon who undertakes ophthalmic operations: Does the regained vision hold, or does it degenerate either slowly or rapidly? Waldmann has inquired into the later history of ninety-nine patients whom he has been able to trace, these having been for the most part under the care of Prof. Schulek of Buda-Pesth. In recording the results, he divides the patients into three classes, placing in Class 1 those who have sufficient vision to read and write, in Class 2 those able only to go about unaided, and in Class 3 those whose sight is completely lost. It is necessary to say also that in no case does he record a case in which less than one year has elapsed since operation; in one case twenty years had passed, and the average duration was seven. There were in all ninety-nine cases of primary glaucoma in eighty-six individuals, in forty-two of whom there was absolute glaucoma in the other eye. Of cases operated upon in the prodromal stage there were seventeen, of whom one only appears in the third class, fourteen are placed in the first, and two in the second: thus, putting the first and second classes together, we have a fair result in 94 per cent. Of "inflammatory glaucoma" (one should rather say congestive) there were thirty-five, of whom twenty-one may be placed in the first, twelve in the second, and two in the third class respectively; a fair result, then, in 94 per cent. It is added that one of the two "failures" was known to have been sufficiently well to work ten years after his operation. This table bears out the generally accepted notion that iridectomy is more efficient against acute glaucoma than in any of the other forms. Out of forty-seven cases of chronic glaucoma or glaucoma simplex, twenty were placed in the first class and thirteen in the second, making thus a favourable result in 70 per cent.; the remaining fourteen (30 per cent.) were failures. Of these last, however, two were known to be at work ten years after operation. It is considered by many that in glaucoma simplex operation in an eye whose field of vision is cut off so near the centre as 10°, is not likely to be attended by any beneficial result; this, however, is not borne out by Waldmann's records.—*Ungar. Beitr. z. Augenh.*, Wien, 1900, Bd. ii.

ZONA.

THE view most commonly accepted regarding the nature of zona probably is that it is the cutaneous manifestation of a neuritis, though Brisseau pointed out some time ago that the lesion does not invariably follow the precise distribution of the cutaneous nerves, and suggested that the lesion was really spinal, the skin area affected corresponding to the diseased segment of the cord. Abadie brings forward arguments to prove that the lesion has its seat in the arterioles and vasomotor nerves of the skin. As it happens, the nerve supply and the arterial supply of the skin very frequently agree, and hence the idea that the lesion is neural, but where they differ, the lesion follows the course of the vascular, not the nerve distribution. If herpes ophthalmicus be a nerve lesion, why are not the other branches of the fifth nerve affected? Abadie states that the manifestations are in the area of the supra-orbital, frontal, and nasal arteries, and that along the wall of the ophthalmic artery run fibres derived from the sympathetic system which come from the superior cervical ganglion *viâ* the carotid plexus. Should a morbid inflammatory process attack the fifth nerve or the Gasserian ganglion, it would affect the accompanying sympathetic filaments, and thus produce vasomotor changes in the vascular area over which they preside. The vasomotor mechanism of the other two divisions of the fifth nerve has no intracranial connections, and does not come from the superior cervical ganglion: that explains the absence of herpes from the regions which are innervated by them. Thoracic herpes (zoster) is said not to affect the first and second intercostal spaces. Abadie explains this by pointing out that the arteries of these spaces come from the subclavian and not from the aorta, as do the others, and that their vasomotor supply is different.—*Arch. d'ophth.*, Paris, 1899, tome iii.

BLINDNESS FROM DRINKING METHYLIC ALCOHOL.

IT seems that already there are some eight or nine recorded cases of this peculiar occurrence, to which Gifford of Omaha adds a fresh instance; it was that of a German, æt. 45, who drank about half a pint of a mixture of one-third wood alcohol and two-thirds water. The following day he had some of the same potation; and on the day after, violent vomiting set in, with extremely severe headache and foggy vision. A fortnight later he had no light-perception, and the pupils were large and irresponsive to light, the outer halves of the discs were decidedly atrophic, and their margins very slightly blurred. Some improvement in vision, which however proved, most unfortunately, to be but temporary, followed vigorous sweating treatment, along with large doses of iodide, so that he was able to count fingers and to move about unaided; after some time vision diminished again, and he is now quite blind. This "wood alcohol" or methylic alcohol is a very poisonous substance, and has been the cause of a number of deaths.

In two other cases, recorded by Patillo of Chicago, the poisoning was also very acute. Two painters who were employed for a few days in applying shellac to some new beer vats (in which, of course, there was little ventilation), nearly completely lost vision. The shellac was dissolved in "Columbia spirit," which is said to contain 97 per cent. of alcohol. The temperature in the vats at the time was about 70°.—*Ophth. Rec.*, Chicago, Sept. and Dec. 1899.

LACHRYMATION AS A SYMPTOM OF ATAXIA.

IN a large proportion of cases of locomotor ataxia, according to certain authors, one of the earlier among the eye symptoms is overflow of the lachrymal secretion. The simplest explanation of the condition manifestly is, that owing to imperfect action of the orbicularis, the lower lid, and with it the lower punctum, is not kept in proper approximation to the globe, and the tears are thus apt to overflow upon the cheek. This explanation does not require the assumption of any true hypersecretion, but it has been suggested that this may be the expression of a reflex excitability of the facial secretory apparatus, analogous to the hyperhidrosis which is occasionally seen. This is the more likely that the upper twigs of the facial nerve spring from a separate nucleus in close proximity to those of the third nerve.—Mendel, *Med. Rec.*, N. Y., 9th Sept. 1899.

NEURO-PARALYTIC KERATITIS.

THE conclusion arrived at by Seydel of Breslau, in a lengthy paper, is in accordance with that originally promulgated by Magendie, namely, that the most satisfactory explanation of neuro-paralytic keratitis is that it is due to trophic disturbance. Most authors who support this view assume that in the trigeminal nerve there are trophic fibres, but Seydel considers that vasomotor paralysis is sufficient to account for the condition without any further assumption, and it is in the absence of sensation that the interference with nutritive supply becomes of great importance. Seydel's careful examination of the accounts of most of the recorded cases has led him to the opinion that in a large proportion other cranial nerves as well were injured. In a case of his own, in which he diagnosed a tubercular lesion affecting the Gasserian ganglion, there was evidence of a partial paralysis of the sympathetic on the same side as the affected trigeminal; and in this case and in two others, in which resection of the ganglion had been performed, ulceration of the cornea had occurred. His opinion is that for neuro-paralytic keratitis to take place, it is necessary to have an affection both of the fifth nerve and the sympathetic, for he regards it as a trophic lesion for the occurrence of which both loss of sensation in the cornea and paralysis of the sympathetic are essential. He considers that for the very small amount of tissue change which goes on in the normal cornea, the nourishment supplied is sufficient even when the sympathetic is paralysed, but let the sensitiveness of the cornea be lost, and tissue activity becomes much greater, owing to the prejudicial action of external influences; for this increased demand the diminished nutritive supply is insufficient, and ulceration occurs. He draws an analogy between this condition and the perforating ulcer of the foot seen in locomotor ataxia.—*Arch. f. Ophth.*, Leipzig, Bd. xlviii.

Eye Affections in Persons who work with Hyacinth Bulbs.

For a long time now it has been recognised in Haarlem, the great bulb growing district of Holland, that, during August and September particularly, the workers with hyacinths were liable to an irritable affection of the skin and to conjunctivitis. It seems that during these two months especially the florists are very busy separating the young bulbs from the parents and sorting them out, during which processes much dust is shaken from the bulbs. Two "diseases" of the hyacinth have also long been known, one in which there is the formation of a small elongated nodule on the bulb, containing (as seen under the microscope) a number of small "worms"; these die soon after removal from the bulbs. The other disease consists in the formation of small hard brittle crystals, probably from the existence of some form of irritation of the tissue of the bulb; among the dust of these crystals are to be found small mites about the size of cheese mites, their larvæ and eggs. It is probable that the sufferings of the workers are due to the penetration of these mites into the skin and their presence in the conjunctival sac, though Zeper, who writes on the subject, admits that he has never actually found them in either situation.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, Dec. 1899.

Hot and Cold Compresses.

What effect upon the temperature of the eye is produced by hot and cold compresses applied to the lids? One would naturally suppose that hot compresses raised the temperature, while cold lowered it, but the first observations made on this topic seemed to prove the precise opposite. It has now, however, been finally proved that by means of hot compresses the temperature can be raised by 1·°5 to 3°, the maximum being attained in about ten minutes, and with iced water a reduction of 3·°5 to 8·°5 can be brought about in about ten or fifteen minutes. After the removal of either kind of compress the conjunctival sac returns very speedily, to its normal temperature, which is attained in some seven minutes or so. The influence upon the temperature is produced by simple conduction through the tissues.—Hertel in *Arch. f. Ophth.*, Leipzig, Bd. xlix. S. 1.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*7th February* 1900.—Dr. Alexander Bruce showed a patient suffering from insular sclerosis, and showing adductor clonus.—Mr. George Cathcart showed a case of excision of the cæcum for tubercular ulceration and contraction.—Dr. Norman Walker showed a case of ulceration on the arm, probably tubercular.—Mr. Caird showed two specimens illustrating syphilitic necrosis.—Mr. Wallace showed a specimen of fracture of the radius.—Mr. Cotterill showed a simplified form of trephine.—Mr. Cathcart demonstrated a plan for using gauze dressing rolled up into balls.—Mr. Caird read a "Short Note on a Case of Ligature for Femoral Aneurysm." The patient, who was shown, suffered from aneurysm of both femoral arteries. The right leg became swollen and cold, and pulsation in the tibial arteries could not be felt. It was decided to ligature the femoral. The patient gradually improved, though the limb for some time remained in a dangerous condition.—Mr. Wallace read a "Short Note on Hæmaturia due to Bilharzia Hæmatobia." This condition is found in two regions—Egypt and South Africa. In South Africa the boys suffer much more than the girls. The parasite is supposed to enter the body by the urethra, anus, or skin. In Egypt, on the other hand, the common belief is that it enters by the alimentary canal. Mr. Wallace had recently three cases under his care, all from South Africa. In one, with the hæmaturia there was priapism and seminal emissions. In Case 2, a severe attack of renal colic was the most marked symptom. In the third case there was nothing complained of save the hæmaturia, and it was only on carefully examining the blood clot that the diagnosis was made clear, and the ova demonstrated. Beyond treating symptoms, nothing can be done.—Dr. Ireland read a paper "On the Increase of Nervous Diseases and Insanity." He had, he said, gathered statistics from medical practitioners all over the country, and from other sources; and he had come to the conclusion that probably the milder forms of nervous disease had not increased, but that the graver forms had increased in recent years. He thought that influenza is partly responsible for this increase, as it apparently causes some of the forms of disseminated sclerosis. Though the struggle for existence is greater nowadays, wages are better, and money has a greater purchasing power, while drunkenness was certainly decreasing. This, on the whole, tended to make nervous diseases and insanity less common.

Edinburgh Obstetrical Society.—*14th February* 1900.—Dr. J. W. Ballantyne, Vice-President, in the chair.—Specimens:—Professor Simpson showed—(*a*) Hydatid mole, (*b*) bottle of levurine, (*c*) head of a child delivered by basilysis, (*d*) uterus with submucous fibroid removed by pan-hysterectomy.—Dr. J. W. Ballantyne showed—(*a*) Fœtus with absence of radii and deformity of thumbs, (*b*) fœtus with anencephaly, (*c*) photographs of historical teratological phenomena.—Dr. **Keppie Paterson** showed a hydatid mole. **Communications**:—Dr. **Macvie** read a paper on "A Case of Eclampsia having a peculiar Puerperal History; and Observations on Coma." In her three previous confinements the patient had been subject to stupor during the puerperium, but not from eclampsia, and there had been no albumin in the urine. In her fourth confinement she had puerperal eclampsia, and albumin was discovered in the urine. Dr. Macvie bled the patient, and she recovered, but died ten days later. Dr. Macvie argued that the coma following convulsions was due to the excess of carbonic acid in the blood. This carbonic dioxide accumulated in the blood, owing to the frequent eclamptic seizures and interference with respiration. He believed that oxygenation was what was required in many cases.—Professor **Simpson** read a paper on "Basilysis," with notes of a case of this operation. He showed an improved model of the basilyst, which was much lighter than the original instrument.—He also read a "Note on the Use of Levurine." He had learned of the drug from Doyen of Paris, and had found it useful in reducing temperature, and ameliorating the symptoms of septic poisoning.

Royal Medical Society.—*January* 26, 1900.—Dr. **Barclay** in the chair.—Dr. C. H. J. **Watson** communicated a paper dealing with two cases of foreign body in the eyeball. The first case was that of an engineer, complaining of great pain in the left eyeball and loss of sight. It was found, on examination, that his vision was only equal to distinguishing shadows at a distance of 1 ft. The light projection was good, except in the upper and outer parts of the field. Movements of eyeball unimpaired. Pupil regular, and reacts well. Lens in a condition of cataract. An old cicatrix was discovered passing downwards from the centre of the cornea. The diagnosis was, foreign body in the vitreous. The foreign body was removed by means of Snell's electro-magnet, and was found to be a small particle of steel. The other case was in that of a stone-mason, the history being similar to the former. The eye was explored by the same method, but the foreign body was not found. The eyeball was excised some time after, when the foreign body was found to be a small particle of stone. In the after-treatment, chlorine water was used as an antiseptic, and at the same time to check any tendency to sympathetic ophthalmitis. Pain is speedily relieved by the use of chlorine water.—Mr. R. A. Ross communicated a paper on the diagnosis of abdominal tumour, and quoted a case to show the difficulty of diagnosis often experienced between tubercular ulceration of the bowel and cancer of the pyloric region of the stomach.—Dr. **James Miller** communicated a paper on the "Staining and Examination of Blood Films," and adverted to the usefulness of a blood examination in all cases of doubtful diagnosis.—Dr. **George Mackie** exhibited specimens—(1) A fœtus delivered by Ramsbotham's hook; (2) a dermoid cyst of the one ovary, and a cystoma of the other.—Dr. **Comrie** showed a specimen of malignant disease of the stomach.—Dr. **Jeffrey** exhibited some photographs illustrating clinical cases.

February 2, 1900.—Dr. J. D. **Comrie**, President, in the chair.—Dr. **Dingwall Fordyce** read a paper on a case of pneumonia, confined to the upper lobe of the right lung, in a boy æt. 16. Temperature, 105°. Pain in chest and general weakness were present for forty-eight hours before the pneumonia thoroughly established itself. He stated also that in commencing consolidation of one apex, the pupil on that side is often dilated; this was not observed in this case. The treatment consisted in the application of ice-cold compresses and ice-cloths to the surface of the body, to keep in check the hyperpyrexia. The patient was given large quantities of alcohol, and sleep and diminution of pain were secured by means of paraldehyde.—Dr. **Henry Wade** read a dissertation on "Cardiac Therapeutics." He alluded specially to the treatment of valvular affections, and discussed the value of strophanthus in cases of valvular incompetence and failing heart conditions over digitalis.

9*th February* 1900.—Dr. **George Mackie**, President, in the chair.—Dr. A. M. **M'Intosh** read a dissertation on the "Prognosis and Treatment of Pulmonary Tuberculosis," written by Dr. **Alexander Goodall**. Dr. Goodall first dealt with the question of the great value of careful and repeated examinations of the lungs, as affording a clue to the extent of the mischief, and, more important still, its rate of progress. The less the extent of mischief the better naturally is the prognosis, but it must be borne in mind that the rate of progress of the lesion may materially alter the above fact. No satisfactory prognosis can be given unless one has the case under observation for some time, because one cannot be at all sure on first examination whether all the signs and symptoms are due to tubercle or to an accompanying catarrhal pneumonia and bronchitis.—Mr. **Fitzwilliams** read a communication on "Three Cases of Cancer of the Rectum," dealing chiefly with the different operations devised and advocated for this serious affection.—Mr. **George Carmichael** read a paper on the "Etiology of Flat Foot," in which he suggested that the use of heels on boots was largely instrumental in altering the curvature of the plantar arches, and so leading to the production of flat foot.

16*th February* 1900.—Dr. A. **Dingwall Fordyce**, President, in the chair.—Dr. F. W. N. **Haultain** exhibited a number of microphotographs illustrative of the condition known as deciduoma malignum of the uterus, and quoted numerous extracts from researches which he had made into the etiology and pathology of the condition. Dr. Haultain first drew attention to the fact that there was no case of deciduoma malignum recorded as having occurred outside the child-bearing period of life. A considerable number of the quoted cases have begun to develop after an abortion, and more particularly after the expulsion of a hydatid mole, and in such have frequently caused difficulty in diagnosis; the symptoms present in some cases point strongly to the condition of a retained conception. Microscopically the tumour is seen to consist of huge multinucleated masses of cells, scattered here and there in a tissue closely resembling ordinary reticulated connective tissue. These large masses are called the syncytium, and the cells of the surrounding tissue closely resemble the individual cell elements of the syncytium. The diagnosis is rendered easy from the presence of these cell elements.

Dr. Haultain regards the growth as of epithelial origin, while Kanthack and Sanger look upon the growth as a sarcoma. In referring to treatment, it was pointed out that hysterectomy was the only successful mode of dealing with it, and in one of Dr. Haultain's cases, where hysterectomy was done early, there had been no return after fifteen months.—Dr. J. **Boyd Jamieson** read a dissertation on "Hæmorrhage in Pregnancy and Labour," in which he specially referred to the importance of the early diagnosis and proper treatment of the conditions known to give rise to such.

Glasgow Medico-Chirurgical Society.—*February* 7, 1900.—Dr. **Ritchie Thomson** showed a case of dislocation backwards of both bones of the fore-arm. The bones are now in position, and movement of the elbow is unimpaired; but there is contraction both of the wrist and fingers, and coldness of the hand. Dr. Thomson believes this to be due to pressure on the brachial centres.—Dr. **Kirk** showed a case of modified cretinism in a male, æt. 21. In this case there was no defect of speech, very little myxœdema, and the temperature was normal. The patient was stunted in growth (4 ft. ½ in.), was defective in intelligence, and had the heavy features of the cretin. He was easily exhausted by any kind of exercise. Since the commencement of treatment, ten months ago, he has become much more active and intelligent, has gained 4¾ in. in height, and lost 7 lb. in weight.—Dr. **Carslaw** showed some of the characteristics of Friedreich's disease, in a male, æt. 20—loss of sensation in the fingers, inability to use his hands without seeing what he is doing, and difficulty in walking, especially in the dark. Speech and intelligence are good. There are no eye symptoms, unless from time to time a little nystagmus. There is no paralysis, and no tremors or spasms. Marked anæsthesia is present from elbow and knee downwards on both sides. Analgesia is not so well marked. Sensation of heat and cold is fairly good, but the muscle sense is practically gone. The patient cannot stand steadily with feet together, particularly if the eyes are shut, nor walk steadily along a line. Shooting pains and girdle sensation are absent. There is no history of syphilis in the parents, and none of the other members of the family have been affected with nervous complaints.—Mr. **Maylard** read notes of a case of carcinoma of the rectum, in which artificial anus had been made, so that the patient had some control over the evacuations. An incision is made in the left groin over the sigmoid. Another incision is made about 2 in. to the left of the first incision, and the layers of the abdominal wall are separated between the two. A piece of large bowel is pulled as far as possible through the first incision, between the layers of the abdominal wall and out at the second incision, where it is fixed. The first wound is then closed. At the end of two days the bowel is opened, and at the end of a week the protruding loop of bowel is amputated. The proximal end acts as the anus. The control is purely mechanical.—Dr. **Hinshelwood** showed a case of Graves's disease treated with antipyrine. The exophthalmos is now scarcely noticeable. Dr. Hinshelwood has had other two cases, which have improved under the same treatment. He pointed out that all were cases in the initial stages of the disease, and that, as many cases get better without treatment, the benefit may not have been wholly due to antipyrine.

16*th February* 1900.—Mr. R. H. **Parry** showed two cases of abscess in the frontal lobe of the brain. In both cases the abscess followed an injury to the forehead. The first patient, a girl æt. 6, was operated on in September 1899. A large quantity of pus was evacuated from the frontal lobe. The patient appeared to have recovered perfectly from the operation. The second patient, a boy who was æt. 6 at the time of the operation, was operated on four years ago. Recovery at the time was perfect. He is now subject to fits. In both cases recovery was tedious. This is due to the fact that the pus gains exit by an opening above the level of the floor of the abscess cavity.—Dr. **Scobie** showed charts to illustrate the serum reaction in the prognosis of enteric fever. Dr. Scobie's conclusion was, that the agglutinative curve, taken in combination with the other symptoms, is a valuable aid in the prognosis.—Dr. **Lindsay Steven** showed specimens from two cases of advanced alcoholic cirrhosis of the liver, in which the initial symptoms were those of chronic intestinal obstruction. In both cases the patients complained first of the swelling of the abdomen. The usual early symptoms of cirrhosis of the liver were absent. The abdomen in both cases was tense and tympanitic, without definite dulness anywhere.

Glasgow Pathological and Clinical Society.—*12th February* 1900. — The President, Dr. **Thomas Barr**, in the chair. — Dr. J. K. **Dalziel** showed two patients, illustrating the occurrence of sarcoma in families. The patients were both females, mother and daughter. The mother was æt. 53, and in 1892 had a sarcoma of the left lachrymal gland removed. Since then she had undergone several operations for the disease. The daughter, æt. 32, came to Dr. Dalziel on account of swelling of right lower jaw, with enlarged submaxillary glands. The right half of the mandible, together with the mass of glands, were removed. The wounds healed well without suppuration, and there is little cicatricial deformity now present. Fourteen days ago a gland was removed from under the scar of the former operation. The tumours were examined by Dr. L. R. Sutherland, who found them to be small round-celled sarcomata. Dr. Dalziel then showed a series of gall stones which had been removed from the cystic and common ducts in seven patients.—Dr. **Knox** showed the parts from a case of acute intestinal obstruction. There was a large gall stone impacted in and obstructing the jejunum. Another stone was found in the common bile duct; while the bladder was fixed to the duodenum, and the ulcerated opening showed the course of the former stone to the jejunum. —Professor **Muir** showed a fresh specimen—the kidneys from a case of diabetes. The organs presented on their surface a mottled aspect, which was limited to small areas. On longitudinal section, whitish yellow lines were seen, corresponding to the mottling, and, while largest in the cortex, could be traced to the medullary region of the organ. He thought from the naked-eye appearances that he had to deal with an infective process, and, on scrapings from the cut surface being examined, found almost pure colonies of staphylococci. The specimen illustrated the weakened resistance of the diabetic.—Dr. **Ebenezer Duncan** showed—(*a*) A heart with calcified pericardium, forming a rigid case for the heart. (*b*) A heart with mitral stenosis. A healed cicatrix in the wall of the ventricle probably resulted from an endocardial affection, following a confinement eight years previously. (*c*) A carcinomatous tumour at root of left lung causing dyspnœa and dysphagia.

OBITUARY.

Professor Sir Thomas Grainger Stewart, Kt., M.D., LL.D.

It is with sincere regret that we have to record the loss which has been sustained, not only by the medical profession, but also by the general public, through the death of Sir Thomas Grainger Stewart. Soon after his return last June from the Congress on Tuberculosis, in Berlin, he began to show symptoms of failing circulation, and during the final examinations he broke down altogether, but with sedulous attention and watchful care he improved in health for a time, and was able to spend some weeks at Dunbar. It became evident, however, in September, that the performance of his public duties was out of the question for the ensuing winter, and arrangements were made for their discharge. The Professor's friends hoped that the quiet rest enjoined might allow of some degree of improvement in health, but these hopes were doomed to disappointment. After many vicissitudes, he began, about Christmas, to show obvious signs of lessened vitality, and on the morning of 3rd February he passed quietly away.

Thomas Grainger Stewart was a native of Edinburgh, and was born on 20th September 1837. After the usual course of education at the High School, he commenced his medical career at the University, where he graduated in 1858. Proceeding to the Continent, he continued his studies in Berlin, Prague, and Vienna, and on his return to Edinburgh he became Resident Physician to the wards under the charge of the Clinical Professors, being more particularly attached to Professor Hughes Bennett. While acting as House Physician, he made some observations of real and permanent value on the symptoms and pathology of waxy kidney. Shortly afterwards he began to lecture on Materia Medica in the Extra-Mural School, but before long he obtained the post of Pathologist to the Royal Infirmary, when he undertook the Lectureship on Pathology at Surgeons' Hall. Defeated for the Chair on that subject by the late Professor Sanders in 1869, he was promoted to the charge of medical wards in the Hospital, and threw himself with ardour into clinical teaching. In 1873 he commenced to lecture on Practice of Medicine in the Extra-Mural School, with his local habitation in the "New Jerusalem Church," opposite the Old Royal Infirmary, and almost on the spot, at the end of Robertson's Close, where the original Infirmary stood. He at once became the most popular Lecturer on Medicine outside the University walls, and introduced many practical improvements in the methods of instruction. His success in the arena of extra-mural competition was so marked, that, on the death of Professor Laycock in 1876, he was appointed to the Chair of Cullen and Alison, which he therefore filled for nearly twenty-four years.

It is too soon yet to attempt any real estimate of the life and work of the late Professor; time alone can render this possible; certain of his most striking characteristics, however, must claim attention.

As a teacher he far outstripped his contemporaries in popularity. The cause was not far to seek. He had a wonderful power of grasping the essential points of any subject, whether in systematic exposition or clinical demonstration; a high degree of lucidity in statement, joined to a luminous style of diction; a very considerable sense of humour, as well as a most kindly disposition; and, above all, a mind well stored with varied information, which he could draw upon as a means of illustration. Always suggestive and often dramatic in his teaching, he contrived with real art to present to his students an impressionist picture of disease which the dullest could not fail to carry away. One great point was his care in detailing the treatment of disease; numbers of his former students in every part of the United Kingdom have told me that they owed much of their after success to this useful training. He was also possessed of a singularly open mind, always ready to receive the newest advances. As a proof of this, it is only necessary to mention that long before the reign of cerebral surgery had set in, he induced Professor Lister to perform operations on the brain for traumatic epilepsy.

Sir Thomas Grainger Stewart was a voluminous writer, and many of his contributions have become part of the current coin of modern medicine. Two of his investigations stand out above all the rest as epoch-making—his early observations on waxy disease of the kidneys, and his later discoveries in regard to multiple neuritis. His success in these two fields led him to publish works on Bright's Disease, and on Diseases of the Nervous System, which have gone through large editions.

In public life the late Professor played an important part. In the local medical societies he held from time to time all the important offices. For some years he was on the Council of the Royal College of Physicians, and was President from 1889 to 1891. He took a keen interest in the Edinburgh Medical Missionary Society, and was its President at the time of his death. When the British Medical Association met in Edinburgh for the third time, in 1898, Sir Thomas Grainger Stewart was elected President, and there can be no doubt that the great success of the meeting was largely due to the admirable manner in which he carried out his duties. Endowed far beyond the common run of mankind with the happy gift of public speech, and shining more especially in the difficult art of after-dinner oratory, he made an excellent head for a gathering of the kind.

He was also a man of liberal culture in many varied directions, especially in history and archæology. The sixteenth century, and the Scotland of that period, were to him subjects of overwhelming attraction. His Harveian Oration on the Medicine of the time of Mary Queen of Scots--his first public excursion into this period—and his later dramatic poem, "The Good Regent," showed how deep and accurate was his information as regards that troubled epoch.

It is incompatible with the purpose of this notice to lift the veil which shields private life, but it is only just to him whom we mourn, that some reference should be made to the Professor's personal relations in capacities which were not official. He was a staunch friend, and he could be a resolute enemy, but in disputes he had learned the benefits of compromise. He was at his best in his own home circle—assuredly one of the touchstones of a man's real character. Generous with his worldly goods, and benevolent in his aims, he has left many schemes of philanthropic endeavour the poorer by his death.

While giving expression to the deep regret for the loss which his death has inflicted on the world of Medicine, and on the community at large, it is our bounden duty to offer, in a manner as delicate as possible, the respectful sympathy of the medical profession to Lady Grainger Stewart and her family, and this we now do most sincerely.

ANALYTICAL REPORTS.

TROPON.

ARTHUR REINER & Co., London, have sent a sample of Tropon, made at the Tropon Works, Mulheim-on-Rhine. This albumin preparation has been tried for a year or two back in Germany by various competent observers, who assign to it a high position among artificial foods. It takes the form of a yellowish brown powder, is devoid of both taste and smell, and consists of proteids of animal and vegetable origin; 33·3 per cent. at least of animal origin.

Analysis gives 90 per cent. of albumins, and about 1 per cent. of mineral matter. As peptic digestion entirely digests all the native albumins in it, there can be no nuclein bodies present. Tropon has been used with great benefit in digestive diseases, and in metabolic disorders. Patients convalescing from acute diseases are able with its help to lay on more flesh; as much as 4 to 5 oz. being easily tolerated, under the circumstances. In December 1898 many of the papers which had been published with regard to the nature of Tropon, and the results obtained from its use, were referred to in this Journal (p. 563). Its advantages seem to be that it is cheap; stable for an indefinite time; easily digested; free from pronounced taste or smell; and is of small bulk. Tropon, like some of the other concentrated proteid preparations, not only adds its own nitrogen to the daily intake, but increases the absorption and utilisation of the nitrogen of the other articles of diet. Such qualities should make it very valuable in convalescent cases.

ECTHOL.

(Battle & Co., St. Louis, U.S.A.)

ECTHOL is a preparation made from plants of the species echinacea and thuja, containing their active principles in constant strength. It is credited with a powerful antipurulent power, and is indicated in such states of the general tone of the body as are marked by the occurrence of boils and pustules. The manufacturers do not claim for ecthol either alterative or antiseptic properties, but one influencing abnormal cell growth and inflammatory processes. We have not yet had sufficient experience of its effects to speak definitely as to this specific action, but conceive that it may be found most useful in, among others, those troublesome cases of pustules and boils in the young, the origin of which is so frequently obscure and the cure so often difficult.

ANTIKAMNIA.

FROM the Antikamnia Chemical Company, St. Louis, U.S.A., have been received two samples of its products—Antikamnia tablets, and tablets of this substance along with Codeina. Antikamnia, as its name implies, is an analgesic and anodyne. It has gained much favour in the United States both for this and for its antipyretic action. A coal-tar preparation from several of the "amido" derivatives, it is strongly believed not to depress the heart after the manner of antipyrin and its allies. Each tablet of Antikamnia contains 5 grs. of the drug (the usual dose), which can be repeated every fifteen or twenty minutes, until three or four doses have been taken. The compound tablet consists of 4·75 grs. of antikamnia and 0·25 gr. of codeina, and has been especially brought forward for the treatment of pain where spasm or physical causes of irritation exist, and which is not amenable to the synthetic drug alone. Both the simple and compound tablets merit a trial in neuralgia and spasmodic ailments and if their reputed freedom from injurious action upon the heart and circulation prove to be invariable, will certainly be received by the profession with favour.

NEW TABLOIDS.

(Burroughs, Wellcome, & Co., London.)

These indefatigable providers of new preparations have sent us samples of two new tabloids and one of their "soloid" series. The three comprise tabloids of Potassium Chloride and Guaiacum Resin, and a soloid of Potassium Permanganate and Alum. The Potassium Chloride tabloid contains 20 grs. of the salt, and is intended for use in place of common salt when desired, for which purpose it is to be powdered down. The Guaiacum Resin tabloid contains 5 grs. of the resin, and offers a way in which this disagreeable substance can be swallowed untasted. The soloid contains 3 grs. of the permanganate of potassium and 5 grs. of alum; one soloid forming a suitable strength for injections and lotions dissolved in from 6 to 10 oz. of water. These additions to the company's list of tabloids have all good points and conveniences.

DYLISSIA.

(Durant & Co., London.)

Dylissia is a generic name, applied to a series of toilet preparations; the origin of the word is quite apparent. Dylissia toilet and medical creams, dentrifrices (toilet, popular and carbolic), and powders are supplied. The Medical Cream, which we have had an opportunity of trying, is very pleasantly scented with otto of roses, and is readily rubbed into the skin, giving it a soft velvety surface, and relieving irritation. Dylissia Medical Cream forms a most agreeable means of applying a soothing ointment to the skin, and ought to prove as efficacious as it is delicate.

KEEN'S MUSTARD.

Samples of the mustard prepared by the well-known firm of Keen have been submitted to us, and as at this date it can be of little use describing what is so widely familiar to most people, it will be sufficient to state that Keen's mustard has lost none of those attributes so long exhibited by it in the past, and which have led to its present popularity.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Five Weeks ending January 27, 1900; and for the Year from January 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean . .	36°·90	28°	178°	2·6	2·6	32	32	3°·2
Observed .	38°·65	24°	114°	3·5	3·5	37	37	2°·47
Difference .	+1°·75	−4°	−64°	+0·9	+0·9	+5	+5	−0°·73

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland (Edinburgh, Dundee, Aberdeen, and Leith), during January 1900. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891-1898	1259	218	215	37·2	117	20·3	298	51·4	140	24·3
Actual Deaths and Rate per 10,000	1399	242	216	37·3	143	24·8	350	60·4	151	26·2
Difference from Mean	+140	+24	+1	+0·1	+26	+4·5	+52	+9·0	+11	+1·9

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891-1898	74	12·9	26	4·5	102	17·76	107	18·5	50	8·6
Actual Deaths and Rate per 10,000	95	16·5	40	6·9	146	25·36	88	21·7	54	9·3
Difference from Mean	+21	+3·6	+14	+2·4	+44	+7·6	−19	−3·2	+4	+0·7

The population of Edinburgh, Dundee, Aberdeen, and Leith, as estimated to the middle of the year 1900, gives a total of 693,321, an increase of 8282 over 1899, or equal to 1·2 per cent.

The meteorological factors for the first four weeks of 1900 show an increased mean temperature equal to 1°·75, due more to the absence of cold weather than to the prevalence of warmth; the accumulated day degrees below 42° showing a deficiency of 64°, or 37·6 per cent. of the normal total, while those above 42° exhibit a decrease equal to 4°. The rainfall recorded was greatly in excess, the increase being as much as 34·9 per cent. over the normal; the hours of bright sunshine were more than usual, and the mean daily variability of temperature much below the average.

The vital statistics for the month show a large increased total mortality, 11 per cent. more than the mean, an increase shown by all the classes of disease discussed, save only by phthisis. Deaths from respiratory diseases, and, separately, from pneumonia, show the largest increases, which are explained by the prevalence of influenza in a true epidemic form during the month. Indeed, influenza directly caused eighty-five deaths, or 6·07 per cent. of the total mortality—6·5 per cent. in Edinburgh, 11·7 per cent. in Aberdeen, 1·7 per cent. in Dundee, and 1·3 per cent. in Leith. As the deaths due to influenzal complications, such as bronchitis and pneumonia, are not recorded under the name of the primary cause of death, and as the weather conditions experienced in January were not of a character to induce any marked increase of pulmonary fatalities, the overplus of deaths from such causes may safely be ascribed, in greater part, to influenzal origin. Adding, at any rate, the excess under pneumonia to the deaths from simple influenza, the figure 129 is obtained, equal to 9·2 per cent. of the total number of deaths. This number of influenza fatalities is greater than in any month since March 1895.

January, therefore, with a high mean temperature, excess of rain, increased sunshine, but diminished variability of temperature from day to day, shows a high death rate, chiefly due to respiratory diseases, and among them largely to pneumonia; while deaths from heart, nervous, digestive, and urinary diseases were also over the average.

EDINBURGH MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

PREVENTIVE OPERATION IN ACUTE INFLAMMATION OF THE APPENDIX.

By MANSELL MOULLIN, F.R.C.S., *Surgeon and Lecturer on Surgery at the London Hospital.*

THE treatment of inflammation of the appendix is nearly always regarded from a strictly medical point of view. Surgery is not considered to have a *locus standi* until a condition has arisen from which it is not likely that the patient will recover unaided. Except in one limited class of case—that in which recurrence has already taken place once or more than once (for even one recurrence is not thought by all sufficient to warrant operation)—the advisability of what may be called preventive operation is not recognised. Events are to be waited for, not anticipated. In the old days of abdominal surgery this doubtless was wise, and perhaps more than wise. But now that abdominal exploration is a perfectly safe proceeding, when performed under suitable conditions, it becomes a question whether the evil traditions which, in the minds of some, still cling around this branch of surgery, are not hampering progress, and preventing the adoption of the principle that, when there is a grave possible danger ahead, and there are no other means of finding out how matters stand, it is wiser to see and to make certain, if this can be done without undue risk, than to trust to chance.

Inflammation of the appendix is sometimes distinguished as catarrhal and infective. The distinction may hold good in some cases for a little while; but it is not one that can be maintained. Leaving upon one side cases of specific inflammation, such as those which are caused by tubercle bacilli and other specific organisms, every case of inflammation of the appendix, even if it is catarrhal at the onset, becomes infective before many hours have passed. The interior of an appendix always contains septic organisms. The epithelium is the protecting barrier. In catarrhal inflammation the superficial layers are always injured and may be destroyed. The protection disappears at once, and then there is nothing left to prevent invasion of the wall. Only when all symptoms subside in the course of a few hours, and leave no ill effect, can inflammation of the appendix be regarded as catarrhal.

I have met with a few cases which will answer to this description. On several occasions I have removed an appendix for attacks of pain, of short duration, but recurring so frequently that the patient was practically disabled, without being able to find evidence that the wall was infected. In one of these the cause was a grape-stone; and it might have been considered to be merely appendicular colic, had there not been congestion and other evidence of slight inflammation of the lining membrane. But these cases are unusual. In the majority, even if the symptoms have been of the mildest character and briefest duration, microscopic examination shows that septic organisms have penetrated the epithelial layer, and invaded the lymphatic interspaces, which surround the tubular glands. In all but the most trivial, the mucous and the submucous layers are invaded as well, and in a very large proportion the whole thickness of the wall, including the serous coat, is involved almost from the first.

The effect depends partly upon the power of resistance possessed by the tissues, partly upon the virulence and number of the organisms, and the extent to which they are assisted by other agencies, such as concretions and stricture, themselves the result in almost every case of previous attacks.

The lymph which is poured out may become organised, leaving the appendix hard and rigid, or divided by strictures, or tied down and distorted by adhesions. The mucous membrane may be ulcerated, or the whole thickness of the wall, and even the whole appendix, may become gangrenous. Suppuration may occur in the interior of the appendix, or in the thickness of the wall, or outside it, leading to diffuse or circumscribed suppurative peritonitis. The organisms may spread along the lacteals into the mesentery, and cause septic lymphangitis and peritonitis, without any visible breach of surface; or they may invade the radicles of the portal vein and set up fatal pyæmia. It is only in comparatively slight cases that resolution can be perfect, that the whole of the exudation can be absorbed, and the appendix completely regain its shape, size, flexibility, and freedom of movement, without a trace of constriction or induration to show what has taken place.

Of these consequences, some, such as portal pyæmia, diffuse septic lymphangitis, and general suppurative peritonitis, are invariably fatal. I am aware that in a few instances early operation has saved a patient's life after diffuse septic peritonitis has begun; but in very few, if any, of these has the peritonitis been really general; and the number even of these is very small in proportion to the number of those who die. Preventive operation—operation before these complications have set in—alone can save these patients' lives.

Another of these consequences, one fortunately which is much less fatal, though still attended by a high rate of mortality, is appendicular abscess—a complication which occurs in a very much larger proportion of cases than is usually believed. I have often been surprised, in operating upon recurrent cases, during a quiet interval, to find a collection of half dried-up pus in the neighbourhood of the appendix, although the symptoms had never been acute or the fever high. I have known this even after a single attack, and that one of so mild a description that it was for some time an open question whether the appendix was involved at all. And there can be no doubt that in many of those cases in which the temperature remains high for several days, and then falls suddenly with a feeling of intense relief, the immediate cause is an abscess which bursts into some neighbouring portion of the intestine. Sometimes these collections of pus are from the first adherent to the anterior abdominal wall, so that the patient runs but little more risk than that which is inherent on the presence of a deeply seated fœtid abscess. But not unfrequently they lie enclosed on one side, or even on all sides, merely by coils of intestine adherent to each other; and then there is always imminent danger of rupture, and of one of the most fatal forms of septic peritonitis. These cases, like those comprised in the former group, every one admits require operation, and the earlier the operation is performed the better. Delay merely serves to increase the size of the abscess, and to give it an additional chance of bursting into the cavity of the peritoneum.

Now, it is admitted that at the onset of an attack of acute inflammation of the appendix, when there is a rapid pulse and the patient is suffering from severe pain, it is impossible to say what is going to follow, whether it will be gangrene of the appendix, or ulceration, or perforation, or acute septic lymphangitis, or portal pyæmia, or merely circumscribed suppuration. In some of these a preventive operation is the only hope. In the others an operation must be performed at last. It is perfectly fair, therefore, to ask which alternative, in the present certainty of abdominal surgery, will give the patient the better chance of life?—To make a small exploratory incision in the right iliac fossa, before suppuration or gangrene has set in, and deal with the appendix according to its condition? or to wait, in the hope that the consequences which are inevitably fatal will not occur, and that suppuration, if it does set in, will be circumscribed and not diffuse?—to anticipate events, or to wait for them, without the smallest chance of being able to control the issue?

But there are other consequences which must also be taken into consideration. Suppuration may never occur at all. The acute inflammation may subside, and the patient be left with a hard tender mass in the iliac fossa, which always hurts him when he uses his right leg freely, and never allows him to forget the attack he has gone through. Or the attack may subside completely, and the patient imagine he has entirely recovered, until suddenly, a few weeks or months later, all the old symptoms return again with sometimes a greater, sometimes a less, degree of intensity, but always with the risk of something worse. In both of these cases it is recognised that operation is required, in the one to free the patient from an appendix in a state of chronic inflammation; in the other, to prevent a recurrent attack. In both alike, the operation is attended with a very high degree of success. Preventive operation in the course of the first few days of the attack could not be more successful. But is there any reason to think, supposing these cases were operated upon as a preventive measure, because of the risk of gangrene, at a time when it is impossible to say that gangrene or some other consequence, no less serious to life, will not occur, that the result would be in any way less successful?

It comes to this, then, that if all the cases of inflamed appendix, which, under the present method of treatment, come to operation at last, were operated upon at once, say before thirty-six hours have elapsed, some lives which are lost now would be saved; and there is no reason to think that any of the patients who are saved now by operation would be exposed to additional risk, while certainly the duration of their illness would be materially curtailed, and the chance of grave accidents setting in considerably lessened.

But it is always urged that there is a large, a very much larger number of cases which never require operation at all, and that if early operation became the rule, to any extent, many of these patients would be operated upon unnecessarily. No one can deplore unnecessary operations more than I do, and I am quite willing to admit that it is not possible as yet to assign their proper pathological value to the various clinical symptoms present in this disease. There is nothing which can tell us that ulceration is beginning, or that gangrene is at hand. In many cases we cannot even tell whether pus is present or not. But I am sure that in a very large proportion of cases, if not in all, it is possible, at the end of thirty-six hours, to form' a tolerably accurate estimate as to whether the attack will be a grave one or not, remembering always that no case is free from the risk of accident until the patient has thoroughly recovered.

Putting aside those cases in which the symptoms are simply those of sudden intestinal perforation (for about these there is no doubt), the key is to be found, not so much in the intensity of the symptoms at any given moment, as in the way in which they either advance or recede. We have to deal with an acute infective inflammation of a badly-nourished portion of the intestine, lying free in the peritoneal cavity. If the symptoms begin mildly and grow worse, or if they begin with severity and do not show signs of definite improvement within thirty-six hours, or if at any time they break out suddenly with great intensity in the course of what appears to be a mild attack, it is reasonable to assume that the septic organisms, if they have not already reached the serous surface in sufficient number to excite suppuration, are at least not far from it; and that, if they have not already compromised the vitality of the intestinal wall, they will at any rate cause so profuse an exudation that complete resolution, a resolution so perfect that it does not leave a trace of induration or adhesion behind, is most unlikely.

Great stress is laid by some on the frequency with which what are rightly regarded as the cardinal symptoms of inflammation of the appendix fail to appear. It is said that because of this it is impossible to form an opinion as to the future of the case in its early stages. But with the sole exception of increasing rapidity of the pulse rate (which I believe to be invariable in grave cases), the absence of one or more of the other symptoms is not of the least importance. We must judge from those that are present. I have known pain and tenderness to be entirely wanting in one of the most acute cases I have ever seen, but there was no doubt. Temperature may be normal, and the whole appendix on the verge of gangrene, but there are always other signs. If, while the pulse rate continues to increase in rapidity, the pain grows more severe, or the abdomen becomes distended, or the tenderness becomes greater, or the dulness increases in extent, or the vomiting becomes more frequent, an exploratory operation should be performed while there is yet time, and the source of the mischief found and examined. I have never met with such a case myself, but I should not hesitate to do the same on the increase in the pulse rate alone, even though none of the other symptoms pointed to any grave degree of severity. It may not be possible to say what will happen, but there can be little doubt but that something serious will, and that in a few hours' time it may be too late.

Preventive operation must, however, really be preventive in the narrow sense of the term, and must not be confused with what is called early operation. Gangrene of the whole appendix may make its appearance within twenty-four hours of the time when the symptoms were first noticed. (I do not say within twenty-four hours of the beginning of the attack, for I believe there are earlier symptoms in these cases, only they are either not noticed or not remembered.) Suppuration is not uncommon at the end of forty-eight hours. An operation, therefore, to be preventive must be performed before this. As regards the actual time, each case may be judged upon its merits; it may not be possible to wait thirty-six hours, or it may not be too late after forty-eight. But whenever it is performed it must not be confused with operation upon the fourth or fifth day (the time when so-called early operations are usually performed), when the abdomen is already distended, and the intestine paralysed. By that time more or less general peritonitis has already set in; the time for preventive measures has passed by; and such a proceeding as an exploratory incision in the right iliac fossa will no longer satisfy the requirements of the case. These are the cases which cause the mortality to be so high, and they are the ones which could be saved by the timely adoption of a simple and almost harmless exploration.

PERIGASTRIC AND PERIDUODENAL ABSCESS.

By W. Soltau Fenwick, M.D., M.R.C.P., *Senior Physician to the London Temperance Hospital; Physician to the Evelina Hospital for Sick Children.*

Although a localised abscess in the abdomen had long been recognised as an occasional result of perforation of the stomach, the clinical features of the complaint do not seem to have attracted much notice until the year 1845, when a case was successfully diagnosed by Drs. Barlow and Wilks. In 1879, Leyden published his celebrated paper upon "Pyo-pneumothorax Subphrenicus," and since that time the symptoms and signs of a perigastric, or, as it is sometimes called, subdiaphragmatic abscess, have received a considerable amount of attention. The following remarks concerning the clinical aspect of the disease are based upon an analysis of fifty-six cases, which include twelve of my own:—

Previous History.—In almost every instance the patient has suffered from the symptoms of gastric ulcer for a considerable time before the occurrence of the perforation. In only 8 per cent. of the cases had pain after food existed for less than a year, while in the remainder it had lasted from one to five years, or even longer. As a rule there has also been acidity, vomiting, constipation, flatulence, and localised tenderness in the upper part of the abdomen. On the other hand, it is important to observe that the victims of perigastric abscess have seldom suffered from hæmatemesis, only about 6 per cent. of the cases having vomited blood before perforation took place.

It sometimes happens that the previous symptoms of ulceration have been so slight as to escape the patient's recollection (Case 1), and it is only after persistent questioning that the former existence of some painful disorder of the stomach can be determined. As this fact is always of the greatest importance in the diagnosis, no pains should be spared to obtain a correct history.

INITIAL SYMPTOMS.—In the great majority the occurrence of perforation is accompanied by characteristic symptoms. In almost every instance the patient is seized with sudden and severe pain in the abdomen, which in about 28 per cent. is followed by collapse. Occasionally retching and vomiting or an attack of diarrhœa are prominent symptoms, or a succession of rigors may mark the commencement of the peritoneal inflammation. For the purposes of description it is convenient to recognise two varieties of perigastric abscess, the acute and the chronic. The former is most often encountered in young women suffering from a chronic ulcer near the cardiac orifice, in whom the perforation is apt to excite suppuration beneath the left wing of the diaphragm. In such an abdominal tumour is usually absent, and the principal symptoms depend upon secondary inflammation of the thoracic viscera. In the chronic variety, which occurs chiefly in men of middle age, the symptoms gradually subside as the abscess becomes encysted by fibrous adhesions, and many months or even years may elapse before the appearance of a tumour or the supervention of pleurisy or pneumonia demonstrates the real nature of the malady.

1. *The acute form.*—As a rule the symptoms of gastric perforation are very conspicuous, but if the patient is the subject of tuberculosis, cancer, or of some other debilitating malady, the accident may only be portrayed by an increase of the abdominal pain or by sudden collapse.

Pain is invariably complained of as soon as the initial shock has passed off, and is chiefly referred to the epigastrium and left hypochondrium. It is usually increased by deep inspiration, coughing, and by movements of the body, and is sometimes so severe as to necessitate the administration of morphine. *Dyspnœa* is another frequent symptom, the breathing being quick, shallow, and costal in type. In every instance the patient exhibits the appearance of extreme illness, and usually lies upon her back with the head low and the knees bent; but when pulmonary or cardiac complications ensue, she often prefers to be propped up in bed. *Cough* is almost always present after the first few days, and is occasionally accompanied by rusty expectoration. *Retching* and *vomiting* are troublesome symptoms in many cases. The bowels are usually confined. The pulse is quick, small, and feeble; the urine is retained or micturition is difficult, and incessant hiccough is often present. In the majority of cases the formation of the abscess is accompanied by a remittent form of *fever*, the temperature rising to 102°–103° F. at night, and falling to 99°–100° F. in the morning. It is important to notice, however, that in debilitated persons, and also in those who have been subjected to laparotomy for gastric perforation, a large abscess may form beneath the diaphragm without any rise of temperature. In the following case continued fever without obvious cause was the only symptom which led to the suspicion of a perigastric abscess.

Case 1.—A young woman was admitted into the London Hospital, under the care of the obstetric physician. She had been apparently in good health until a few weeks previously, when she was supposed to have had a miscarriage. She made no complaint of pain, but her temperature was elevated, the pulse quick, and she felt weak and ill. The uterus and the pelvis were examined, but no disease could be discovered, and as careful inquiry seemed to negative the supposition of abortion, she was transferred to the care of the physician. There was no cough, expectoration, or other pulmonary symptom, and the thoracic organs were normal. The back of the right lung was carefully examined, lest there should be a localised empyema, but no physical signs of that disease could be detected. The abdomen was apparently normal, and there was neither albumin nor sugar in the urine. At first she denied that she had ever suffered from pain after food, but she afterwards admitted that for some months before her illness she had been subject to "indigestion." She never had hæmatemesis. During her residence in the hospital she never complained of pain after food, and there was no vomiting or flatulence. Nevertheless the temperature continued markedly remittent in character, rising to 103° and 104° F. in the evening, and falling to normal in the morning. As the pyrexia appeared to indicate the presence of an abscess which could not be discovered, it was surmised that there might be suppuration behind the stomach in connection with an old ulcer. No operation was considered advisable, and the patient gradually sank from exhaustion.

At the autopsy the organs of the body were found to be in a healthy condition, except the stomach, on the posterior wall of which was a chronic ulcer that had perforated the viscus and communicated with a large abscess situated in the cavity of the lesser omentum.

The above case shows how difficult it may be to diagnose a perigastric abscess, even when the collection of pus is a large one. The patient's own impression was that her illness had resulted from a miscarriage, and it was only after careful examination that the obstetric physician came to the conclusion that the pelvic organs were not responsible for the symptoms. There was no abdominal pain, vomiting, or tenderness, nor was there any history of hæmatemesis, and it was only after persistent questioning that the patient confessed to having previously suffered from "indigestion." No distension of the abdomen or tumour was observed; and if it had not been for the persistent pyrexia and weakness, no idea of suppuration behind the stomach would ever have been entertained.

Rigors occur in about 10 per cent. of the cases, but they are seldom frequent, unless pylephlebitis or general pyæmia has resulted from the abscess.

In the great majority of the cases *secondary inflammation of the pleura or lung* supervenes within a few days after the perforation, and often masks to a great extent the abdominal symptoms. The average duration of the disease is about a fortnight; but if the pus perforates the diaphragm or bursts into the peritoneal cavity, death may occur at a much earlier period. In the following case the complaint ran a very acute course, and terminated by general peritonitis on the sixth day.

CASE 2.—A nursemaid, æt. 23, was admitted into hospital for pain in the abdomen and vomiting. She stated that for the last eighteen months she had suffered from pain and sickness after meals, but had never vomited any blood. Her present illness began two days before, when about one hour after dinner she felt as if something had given way in the abdomen; she was immediately seized with an agonising pain, and became partially unconscious. When she revived she complained of intense pain all over the upper part of the abdomen, and had several attacks of shivering, followed by sweating. There was also much sickness.

On admission the patient was found to be very anæmic, and looked extremely ill. The respirations were quick and shallow, the pulse 112 per minute, and the temperature 101°·5 F. Great pain was complained of over the left side of the chest and in the hypochondrium, which was increased by inspiratory efforts and movement of the body. Examination showed the abdomen to be somewhat distended and resonant on percussion, with tenderness on palpation over its upper part, but no tumour could be detected. Signs of acute pneumonia were present in the lower lobe of the left lung.

Two days later a loud friction sound could be heard over the lower half of the left chest. The temperature rose to 103° F. at night and fell to 100°·5 F. in the morning, and retching ensued after every attempt to administer food. On the sixth day of the disease the whole of the abdomen was distended, and tympanitic on percussion. The apex of the heart was in the fourth intercostal space in the nipple line, and a pericardial friction sound was heard over the lower part of the organ. At the base of the left chest there was dulness on percussion with diminished respiration, and about 6 oz. of turbid serum were evacuated on aspiration. A few hours later the patient suddenly became collapsed and died.

Autopsy.—The abdomen contained several ounces of pus, and the coils of intestine showed evidence of recent peritonitis. There was a large abscess cavity between the left lobe of the liver, the diaphragm, and spleen, with recent adhesions between the stomach and the abdominal wall. These latter had apparently ruptured and allowed the pus to find its way into the general cavity of the peritoneum. On the anterior wall of the stomach, about one inch from the lesser curvature and close to the œsophageal opening, was a perforated chronic ulcer almost the size of a shilling. The base of the left lung was in a condition of grey hepatization, and its pleural surface covered with lymph. There was also recent pericarditis.

2. *The chronic form.*—In this variety the leakage is probably very slight, and confined to the immediate neighbourhood of the perforation, while the pus becomes gradually encapsuled by thick

fibrous tissue, which prevents its further diffusion. In all cases the initial symptoms are identical with those of the acute disorder—sudden and severe pain in the abdomen, with dyspnœa, continued fever, and occasional rigors or attacks of vomiting. Instead, however, of running a rapid course and exciting secondary inflammation of the thoracic organs, the symptoms gradually subside and the temperature falls to the normal, and it may not be for many months or even years that the supervention of pleurisy, perforation of the diaphragm, or the appearance of a tumour upon the side of the chest, demonstrates the presence of the abscess.

As a rule, however, the patient continues to experience pain in the abdomen during the whole course of the complaint, and when this is constant and accompanied by loss of flesh and vomiting, it is apt to excite the suspicion of malignant disease of the stomach. Rigors are occasionally observed, and profuse sweating at night is a frequent symptom. The appetite is lost, the bowels are confined, and great weakness is usually present. The following case is a good illustration of the general features of the complaint:—

Case 3.—A man, æt. 38, was admitted into the London Hospital on 31st January 1881. He was a weaver, and had enjoyed good health until "some time ago," when he began to suffer from indigestion, the food appearing to lie heavy on his stomach and producing great pain. He stated that he had suffered from an injury to the back, but its nature and the date are not mentioned in the notes, and he evidently did not attach any importance to it. He had never had syphilis.

On admission, he complained of very severe pain in the left hypochondrium, which extended backwards round the left side as far as the spine. All this region was very tender on percussion, the most tender spot being opposite the tenth and eleventh ribs. He was unable to lie on his right side, so that he constantly reclined on the left, with the neck bent forwards and the knees drawn upwards. Pulse, 90; temperature, 99° F. He had no appetite; the tongue was thickly furred, and the bowels obstinately confined. The liver dulness extended from the fifth costal interspace to one inch below the ribs, and the edge was slightly tender on pressure. In the left hypochondrium there was dulness on percussion, which extended upwards to the heart's apex and downwards to the level of the umbilicus. The heart's apex was not raised, and there were no murmurs. The lungs were healthy.

On 10th February he had constant vomiting, and complained of the severity of the pain, which extended from the left hypochondrium to the spine, and was increased directly he attempted to take any food. The recti muscles were hard and rigid. On the left side, near the spine, there was dulness on percussion, but no increased pulsation, and no murmur. He had constant nausea.

15th February.—A hardness could be felt below the left hypochondrium, and there was a dull space on percussion in the left hypochondrium, measuring 3 in. longitudinally by 6 laterally. The lower border of the liver was also remarked scarcely to descend on full inspiration, and there was some dulness on percussion, and increased resistance to pressure immediately above the umbilicus. The man continued in much the same state until 22nd April. The pain was excessive and constant, and required the frequent use of subcutaneous injections of morphine. He steadily lost flesh, and was then only 6 st. 12 lb., having weighed 8 st. on admission. The temperature varied from 98° to 100° during February, but rose to 102° in March, and afterwards oscillated until 22nd April, on which date it rose to 103°, and the patient complained of great pain at the base of the lungs behind, although neither dulness nor friction sounds could be discovered.

27th April.—He had a severe rigor, the temperature rising to 106° F., but the pain in the left side was not so severe as usual. The left chest was now found to be dull on percussion, with absence of breath sounds, diminished vocal and tactile fremitus, but no friction sounds could be heard.

29th April.—He had severe sweatings; the area of dulness was considerable in the left hypochondrium, but the tenderness was not increased.

Friction sounds were first discovered on May 2, near the apex of the heart; rigors recurred from time to time, and a herpetic eruption showed itself on the lips, palate, and roof of the mouth. After this period the appetite began to improve, the pain decreased, and the fever disappeared.

12th May.—Friction sounds could be heard over the whole of the left hypochondrium, where there was formerly such marked dulness on percussion. The dulness at the back of the lung had much diminished, and the pain only came on after food.

From this time he rapidly improved; the pain entirely left him, the appetite returned, and he gained (so the notes state) as much as 6 lb. in weight in a single week.

22nd June.—When he was discharged, at the end of five months, the percussion note over the left base was normal, and no friction sound could be detected. There was some fulness under the left hypochondrium, but the part was resonant on percussion.

There is, of course, always a certain amount of doubt about a case in which it is impossible to verify the diagnosis by a postmortem examination, but when the course and termination of the preceding case are taken into consideration, the existence of a perigastric abscess must be considered almost certain. The patient had suffered from the symptoms of gastric ulcer for a long time before he entered the hospital. On his admission, the pain, although constant, was still increased by food, and beneath the left hypochondrium there was an ill-defined tumour, which was very tender on pressure and dull on percussion. After suffering great pain for three months, severe rigors ensued, followed by the signs of acute pleurisy with effusion in the left side of the chest, after which the tumour disappeared and the case terminated in recovery. At first it was considered possible that the disease might be cancer of the stomach, but the continued fever and the subsequent progress of the case soon negatived that supposition. That the tumour was not due to abdominal aneurysm, was shown by the absence of pulsation and murmur, and by its subsequent disappearance; while its rapid development, its peculiar position, and its association with severe gastric symptoms, eliminated the possibility of a hydatid cyst. It is most probable, therefore, that a small abscess had originally formed near the upper curvature of the stomach in connection with a chronic ulcer, and had subsequently burst into the left pleural cavity.

In some instances the pain continues for a long time after perforation has taken place, and is accompanied by inflammation of the thoracic viscera, and finally by the evacuation of the abscess through one of the lower intercostal spaces. The following was probably a case of this kind:—

Case 4.—A gentleman, æt. 45, who consulted me in 1898, gave the following history. In the year 1888 he began to experience severe pain in the epigastrium after meals, with vomiting and constipation. About two years later he suddenly felt something give way in the stomach while engaged in athletic exercise, and was immediately attacked with violent pain and collapse. After many months' illness he gradually recovered, but continued to experience pain after food. In 1893 he suffered from acute pleurisy on the right side, which laid him up for several weeks, and subsequently he suffered from occasional attacks of severe pain in the right side of the chest, which were supposed to be due to gall stones. In 1894 a tumour appeared at the posterior and lower part of the right chest. When it was opened a quantity of curdy pus was evacuated, and the opening continned to discharge for more than two months. Towards the end of the year he vomited a large quantity of blood, and almost died from a recurrence of the hæmorrhage. Since his recovery he had remained very weak, and had suffered from periodic vomiting and loss of flesh.

On examination, the patient was found to be extremely emaciated. When he lay on his back a curious deformity of the abdomen was observed. The left hypochondriac, umbilical, and lumbar regions were occupied by a large swelling, over the surface of which peristaltic movements were distinctly visible. The tumour was tympanitic on percussion, and a loud splashing sound was elicited on manipulation. The other side of the abdomen appeared quite collapsed and empty, and the bony structures at the back of the cavity could easily be felt. There was thickening and adhesion of the pleura on the right side, and an old scar between the tenth and eleventh ribs posteriorly. The shape of the abdomen was not altered by position, and was very evident in the erect posture. The other organs of the body were normal. The contents of the stomach contained an excess of hydrochloric acid.

The diagnosis in this case may be regarded as doubtful, but a little consideration will show how strong are the grounds for regarding it as one of perigastric abscess. After suffering for a long time from the symptoms of gastric ulcer, the patient was suddenly attacked with severe abdominal pain and collapse, and afterwards had persistent pain in the right hypochondrium. Subsequently an abscess pointed at the back of the chest, and continued to discharge for some months. The only rational explanation of such a succession of phenomena seems to be that perforation of the stomach or first part of the duodenum had occurred, and set up a small intraperitoneal abscess, which gradually increased in size and made its way between the liver and the right wing of the diaphragm.

The chief difficulty is to understand how, if the perforation took place in 1890, the abscess did not make its appearance until 1893. It will be observed, however, that during the whole of this period the patient was never free from pain, while the violent attacks from which he occasionally suffered, and the acute pleurisy on the right side, showed that some kind of inflammatory mischief must have existed beneath the diaphragm. I can only suggest that the abscess soon became encysted, and remained latent during the greater part of the time. That this may occur is proved by the following case, which in most of its features was very similar to that just related:—

Case 5. — A woman, æt. 39, was admitted into the Worcester Dispensary on 6th March 1828, under the care of Dr. Streeton. She was suffering from great pain and tenderness in the epigastrium and right hypochondrium. She had also a cough with muco-purulent expectoration, and there was a hard, painful tumour on the back, just below the angle of the right scapula.

She was said to have enjoyed fairly good health till about four years previously, when she had severe pain in the right side, for which she was under treatment five months, being relieved, but never entirely cured.

Shortly after her admission, the above-mentioned tumour broke and discharged purulent matter, and for some time afterwards she appeared to improve, though a sinus remained. At the end of June, a second swelling, situated in the seventh intercostal space, about 1½ in. anterior to the angle of the ribs, opened, and discharged pus and blood. In the first week of July the gastric contents began to pass through this fistula almost immediately after fluid had been swallowed. Milk escaped in a curdled condition five minutes after it had been injected. The patient died at the end of the month.

Autopsy. — Strong adhesions were found between the right lung and the thorax, and between the lung and the upper surface of the liver, the diaphragm being lost in a mass of "fibro-cartilaginous" tissue. There was extensive phthisis. In consequence of the above-mentioned adhesions, the stomach and duodenum were so much displaced that the pyloric end of the stomach passed upwards between the right and left lobes of the liver, the pylorus being attached to the upper surface of the organ and the cartilages of the eighth and ninth ribs on the right side.

The duodenum passed with a sharp bend downwards, also between the two lobes of the liver, being much constricted thereby, and presented, just at the bend, a perforation which communicated with the second of the sinuses mentioned above, by a track behind the ribs 2½ in. in length. The sinus lay in the tough fibrous tissue which connected the liver with the chest wall. The first sinus appears to have communicated with the cavity of the thorax, though it is said that "there was no appearance of disease on the pleura pulmonalis corresponding with the opening."

In the next case the appearance of the abscess after death showed that it must have existed for a considerable time, and might have continued much longer had it not excited fatal inflammation of the pleura.

Case 6.—A man, æt. 51, was admitted into hospital for pain in the chest and debility. He stated that, two years before, he had vomited blood, and had since suffered from pain in the abdomen. For the last week the pain had been constant, and increased by inspiration. At the commencement of his illness some accident had happened, but he could give no details as to its nature. The patient was obviously very ill. The breathing was quick and shallow, and great pain was complained of in the epigastrium and left side of the chest. The upper part of the abdomen was rigidly contracted, and very tender upon pressure. A friction sound was heard over the back of the left lung. Death occurred in a few hours.

Autopsy.—There was a large chronic ulcer on the lesser curvature of the stomach near the œsophageal opening, which had perforated all the coats of the organ. The upper border of the stomach was firmly adherent to the left lobe of the liver, and when the organ was removed an abscess cavity was found, which was bounded above by the diaphragm, on the left by the diaphragm and spleen, below by the stomach, and on the right by the liver. The walls of the sac were composed of dense fibrous tissue, and were separated from the ulcer by fibroid material nearly an inch in thickness.

In the next case, pleurisy with effusion ensued a few weeks after perforation, and it was not until about five months later that the abscess pointed in the left hypochondrium.

Case 7.—A lady, æt. 25, who had suffered from pain after food and vomiting for nearly two years, was attacked, when running downstairs, with violent pain in the abdomen, followed by vomiting and collapse. There was great tenderness over the epigastrium, and the temperature rose to 102° F.; but during the course of the next week the pyrexia disappeared. At the end of three weeks the pain became greatly increased, and when I saw her at the end of the month there was considerable effusion of fluid into the left chest, and the epigastrium was somewhat distended and tender upon pressure. No tumour could be detected. The pleurisy gradually subsided, but she still complained of much pain in the left side of the chest, more especially at night, and had occasional attacks of fever. About five months after the onset of her illness a hard swelling made its appearance in the left hypochondrium, which increased in size and gradually approached the surface. When it was opened, a large quantity of pus was evacuated, and the cavity eventually closed.

These facts appear to indicate that under certain conditions perforation of the stomach may give rise to a small abscess, which remains strictly circumscribed for a considerable length of time.

Abdominal abscess is a rare result of the perforation of a *duodenal ulcer*, but I have been able to collect the details of twenty-two cases of this description, including three of my own. In every instance the ulcer was of long standing, and the proportion of males to females was 10 to 1. In the great majority the formation of the abscess was preceded for some time by pain in the abdomen, which usually occurred two or three hours after meals. In one case it was so intense and continuous that it was regarded as a neuralgia of the cœliac plexus, while in another it seemed to radiate from the navel to the right hip. Vomiting was present in nearly half of the cases, and usually afforded relief to the pain; but in one instance it appears to have been dependent upon hypersecretion, and the stomach was found to be greatly dilated after death.

As a rule, there was a history either of hæmatemesis or melæna, and some had suffered from several attacks of hæmorrhage. Loss of flesh and disinclination for food were prominent symptoms in all, and anæmia was also a noticeable feature in most of them.

The onset of perforation was always marked by violent pain and collapse, and, with a few exceptions, the disease terminated fatally within a fortnight. The usual cause of death was exhaustion and sapræmia, but four died from peritonitis, three from hæmorrhage, two from secondary inflammation of the thoracic organs, and one from pyæmia, with abscess of the parotid gland.

PHYSICAL SIGNS.—The signs which denote the presence of a perigastric abscess vary according to the position of the sac and the nature of its contents. In the early stages of the complaint physical signs are often absent, and we can only surmise its existence from the history and general symptoms of the case. When the abscess is situated between the liver and the diaphragm, as in the acute form of the disease, the left side of the epigastrium and left hypochondrium are distended, and extremely tender on palpation. The abdominal muscles are rigidly contracted, and no movement of the diaphragm can be detected upon inspiration. As the pus accumulates, the fulness of the upper part of the abdomen becomes more noticeable, and the left wing of the diaphragm is pushed upwards. Occasionally this muscle recovers its contractile power to some extent, so that on deep inspiration a shallow depression may be observed to cross the intercostal spaces on the left side ("diaphragm phenomenon"). At the same time the affected side of the chest becomes apparently enlarged, and its lower ribs are thrown outwards, so that the costal angle is increased. The intercostal spaces are also widened, and sometimes bulge slightly. The displacement of the liver and spleen is obscured to a great extent by the rigidity of the abdominal wall, but careful percussion will sometimes show that the left lobe of the liver projects into the epigastrium. In almost every instance the heart is tilted upwards, and its apex may be felt in the fourth costal interspace rather to the left of its normal position. The base of the left lung is compressed and partially deprived of air, so that the percussion note over the left posterior base is comparatively dull, and the respiratory sounds are diminished. This condition is distinguished from pleuritic effusion by an increase of tactile fremitus and vocal resonance, and by the occasional existence of moist crepitations. The presence of gas beneath the diaphragm gives rise to a tympanitic note over the front of the left chest, the upper border of which may extend as far as the fourth rib, or even higher. This resonant area may also be traced across the sternum to the right nipple line, and downwards to the right of the ensiform cartilage, where it merges with the hyper-resonance over the epigastrium and left hypochondrium. The latter sometimes gives place to dulness as the pus encroaches over the cardiac end of the stomach, or the omentum becomes thickened by inflammatory exudation.

On auscultation over the front and lateral aspect of the left chest, the vesicular murmur is either absent or is replaced by loud amphoric breathing. This latter phenomenon is usually due to an alteration of the breath sounds by transmission through the gas-containing cavity, but it is also possible that in some cases a communication between the stomach and the abscess permits the interchange of gas with each movement of the diaphragm. When the subphrenic cavity contains a quantity of both pus and gas, metallic tinkling can often be heard after coughing, and a loud succussion sound may be produced by movements of the body. Finally, it may be noticed that the *bruit d'airain* may be heard over the tympanitic area when coins are clinked together, while the heart sounds occasionally acquire a metallic character.

An abscess situated between the right lobe of the liver and the diaphragm seldom contains much gas, so that its physical signs are somewhat different to those just described. The elevation of the diaphragm displaces the apex of the heart upwards and to the left, and thrusts the right lobe of the liver downwards, so that its lower edge may be felt several inches below the costal margin. The compression of the right lung gives rise to comparative dulness at the base of the chest before and behind, with diminished respiration or moist râles. Above the dull area the percussion note is hyper-resonant, and the expiration prolonged. When, however, the pus is largely mixed with gas, a band of hyper-resonance intervenes between the compressed lung and the upper border of the liver, and the other indications of subphrenic pyo-pneumothorax may be detected. These various signs are most distinct within the first week, since after that time they often become modified by exudation into the pleural cavity or by inflammation of the lung. Pericardial and pleuro-pericardial friction sounds are not infrequent at this stage of the complaint.

The formation of a circumscribed tumour is a rare result of perigastric suppuration, and is chiefly met with in the chronic variety of the disease. When it occurs it is usually situated in the left hypochondrium, or in the epigastrium slightly to the left of the median line. At first the outlines of the swelling are indistinct, but as it approaches the surface they become more defined. The percussion note varies. In some cases it remains dull throughout; in others it is at first dull and afterwards resonant, while occasionally the note varies with the position of the body, showing conclusively that the abscess contains both gas and pus. In almost every instance the tumour is very tender, and deep inspiration gives rise to pain. As a rule it does not move on respiration, nor can it be displaced by pressure with the hand, owing to adhesions. When the abscess points externally, the subcutaneous tissue becomes œdematous and the skin red; while, if its contents are discharged into the chest, it suddenly disappears. In those rare cases where the pus finds its way into the stomach or intestine, the tumour suddenly lessens in size, and its percussion note becomes tympanitic.

When the abscess is situated behind the stomach in the lesser cavity of the peritoneum, no physical signs whatever may be discovered, and hectic fever, with increasing debility, may be the only symptoms of the disease (Case 1). In a few cases a swelling or sense of resistance is stated to have been detected in the umbilical region, which was tender on palpation, and resonant on light, but dull on deep percussion. Occasionally pus and shreds of necrotic tissue are found in the vomit. If the pus eventually reaches the upper surface of the liver, the ordinary signs of subphrenic abscess are manifested.

The physical signs of *periduodenal abscess* are similar to those already described. In more than 50 per cent. of the cases a localised abscess forms a tumour in the right hypochondrium or umbilical region, while in about 30 per cent. the pus burrows behind the peritoneum in the direction of the right iliac fossa. This interesting condition is illustrated by the following cases:—

CASE 8.—A man, æt. 19, was admitted into the London Hospital on 1st November 1881. In the afternoon he had fallen upon his abdomen from a height of 12 ft.; he was picked up by his fellow-workmen and carried home. He vomited everything he took, and was brought to the hospital the same evening. Very little history of his previous state of health could be obtained; but it was stated by his friends that he had been drinking heavily for some time, and that vomiting had commenced two days before the accident.

On admission, the face was pinched and anxious, the pulse very feeble, the skin hot and bathed with perspiration, and he complained of slight pain in the hypogastric region; temperature, 100°·4.

3rd November.—The pain was localised in the right inguinal region; bowels confined.

7th November.—He was very restless, and had fixed pain in the right inguinal region; diarrhœa for two days.

15th November.—He seemed to be in a typhoid condition; fulness was noticed in the right inguinal region, and there was some dulness there on percussion.

18th November.—There was a distinct fulness close to the pubes in the right inguinal region, which was hot and tender; the stools were formed, but offensive.

He gradually improved after this date, and left the hospital on 24th December. His temperature varied between 100° and 103° until 21st November, after which it rose every evening to 102°, falling in the morning to the normal point.

He was readmitted on 1st February 1882. He was then somewhat emaciated, his cheeks thin and flushed, and his expression anxious. There was a hard swelling in the right groin above and to the right of the centre of Poupart's ligament, which fluctuated with an emphysematous crackling, as if air and fluid were intermixed; bowels opened daily. He had little pain or tenderness over the abdomen.

10th February.—An incision was made into the tumour, and a large quantity of yellowish feculent pus was evacuated.

27th February.—The discharge was feculent and profuse, and pressure over any part of the abdomen caused a large quantity to be evacuated.

14th June.—The sinus was more freely opened, and a large amount of fæcal matter removed.

28th June.—Diarrhœa came on, and he became much weaker.

He lingered until 31st July, when he sank from exhaustion, nine months after the accident. The temperature always rose in the evening to 101° or 102°, and generally fell to the normal point in the morning.

Autopsy.—The body was so much wasted that it looked as if the patient had died of starvation. On opening the abdomen, a channel was discovered extending from the under surface of the liver to Poupart's ligament on the right side; it was situated behind the ascending colon, and was 2½ in. wide. The roof and inner wall were formed of thickened peritoneum and the adhering gut, the floor by the thickened fascia covering the quadratus lumborum and the ileo-psoas, the outer wall by the thickened transversalis fascia, and there was a free opening at Poupart's ligament, where a fæcal-stained cavity was situated. The lower horizontal limb of the channel ran behind the pubes, and terminated in a slightly sacculated cavity in the left groin. The channel contained no solid fæces, but its walls were coated with a brownish yellow fæcal deposit. As it was supposed there might be some connection with the intestines, water was injected into the colon and into the small intestines, but none escaped until it reached the duodenum, from which part it flowed out in a large stream into the upper extremity of the channel, and swept downwards to Poupart's ligament. At the point of escape the duodenum presented an ulceration the size of a sixpence, with thickened edges, about 5½ in. from the pylorus, which had perforated all the coats and communicated with the channel. All the other organs of the body were healthy.

CASE 9.—A man, æt. 32, was admitted into Guy's Hospital, under the care of Dr. Goodhart, for painful swelling of the abdomen with pyrexia. Five weeks before, he had been seized with sudden severe abdominal pain and vomiting, three days after which he had an attack of pleurisy on the right side. On admission, the abdominal wall was stretched and shiny, and there was marked fulness in the flanks. No ascites could be made out. When he had been in the hospital for four days, an incision was made in the right iliac region, and 8 oz. of pus evacuated. Ten days later a second abscess was opened above the left groin. Eventually two more incisions were made, one in each loin, and from all four openings pus continued to drain until his death, six months after the onset of his illness.

Autopsy.—The abdominal viscera were found to be firmly matted together by old adhesions, and there were several collections of pus behind the peritoneum. In the duodenum, immediately below the pylorus, there was upon the posterior wall a thick-edged perforating ulcer, half an inch in diameter. (Cited by Perry and Shaw.)

In the next case the patient recovered, after presenting symptoms and physical signs very similar in character to those just mentioned.

CASE 10.—A gentleman, æt. 27, after suffering for some months from pain and "dyspepsia," was suddenly attacked, on 2nd May 1894, with violent pain in the abdomen, and collapse. The next day there was great pain and tenderness in the right hypochondrium and to the right of the navel, and the wall of the abdomen was rigidly contracted. The pulse was 84, and the temperature 100°·6.

7th May.—The pain is more or less constant over the right side of the abdomen, and is increased by lying upon the left side. The breathing is quick and shallow, and there has been some sickness. The bowels are confined. The abdomen is retracted, and very tender over the course of the ascending colon, but no tumour can be felt. The lungs are clear, and the urine is normal.

9th May.—The patient was suddenly seized this morning with acute pain in the right lumbar region, just below the kidney, where there is great tenderness. No blood in the urine. Temperature, 101° F.

13th May.—The pain in the right side of the abdomen and back persists, and he now complains of pain in the left groin, which is somewhat tender upon pressure, and presents slight increased resistance on palpation.

15th May.—There is an indefinite swelling to be felt in the left groin just above Poupart's ligament, with comparative dulness. The pain in the right loin continues, and a kind of "squishing" sound is elicited on percussion. The temperature varies between 100° and 101°·5. The pain is increased after an action of the bowels.

29th May.—The patient has continued in much the same condition since the last note. The swelling in the left groin has not developed, and there are no fresh physical signs. The temperature is elevated at night, but falls to normal in the morning.

30th May.—Yesterday evening patient had an attack of diarrhœa, and passed a large quantity of pus, after which he became somewhat collapsed. The pain in the abdomen has disappeared, and the percussion note in the loin is now clear.

Subsequently he began to improve, but convalescence was retarded by swelling and œdema of the right leg. When this subsided, the progress towards recovery was rapid. The temperature never rose above the normal, the pain did not return, and the patient steadily gained in weight.

When I saw him on 25th September 1897, the following note was made:—There is now no pain in the abdomen, but the patient is subject to flatulence and discomfort after food, and to constipation. When he lies upon his back there is a well-marked hollow in the left hypochondrium, with a corresponding swelling on the right side. The tumour is elastic, resonant on percussion, affords a splashing sound on palpation, and is not altered by the position of the body. The stomach cannot be detected in its usual position. There is comparative dulness over the right lumbar region in front and behind, and the loin appears to be somewhat fuller than on the opposite side. In the erect posture the deformity of the abdomen is still more conspicuous, and peristaltic movements can be seen over the swelling in the right hypochondrium.

Although the notes of the above case are very scanty, there can be little doubt that there was originally perforation of a duodenal ulcer with suppuration in the retroperitoneal tissue. It is also probable that the pus found its way behind the ascending colon, as in Case 8, and also into the perinephritic tissue, but that instead of pointing in the iliac fossa it fortunately burst into the colon, and was evacuated by the bowel. The case is also of considerable interest as showing the deformity of the abdomen which may arise from contraction of the abscess cavity.

These facts appear to indicate that the symptoms and signs of retroperitoneal abscess from perforation of a duodenal ulcer are somewhat as follows:—After the initial symptoms of perforation have passed away, there is constant pain in the right side of the abdomen, accompanied by an elevation of temperature, and great tenderness over the hypochondrium and to the right of the navel. If the pus makes its way behind the colon in the direction of the iliac fossa, the area of tenderness increases, and a swelling appears above Poupart's ligament on the right side, which presents the ordinary features of an abscess. If unrelieved, the pus may travel across the hypogastrium and present in the other groin, or it may gravitate into the pelvis and point beside the rectum. Occasionally the perinephritic tissue is invaded, and great pain is experienced in the loin, with swelling, tenderness, and perhaps a "squishing" sound on percussion, owing to the mixture of gas and pus. In these cases the matter may either present in the loin or burst into the colon.

COMPLICATIONS.—*Secondary abscesses* are an occasional result of subphrenic suppuration, and in the absence of a reliable history of gastric perforation their presence is apt to prove very misleading. The difficulty of diagnosis is well shown in the following case, where, in addition to three collections of pus in the abdomen, there was also an empyema of the left side:—

CASE 11.—A man, æt. 47, was admitted into the London Hospital for a swelling in the abdomen. The history he gave was extremely vague, but it appeared that for eighteen months he had suffered from pain after meals, and that, one month before his admission, he had been attacked by severe pain in the region of the stomach. On examination, a mass the size of a cricket-ball was discovered in the left iliac fossa, which was nodular and painful on pressure; dulness on percussion and distant breath sounds were also found at the base of the left chest. A few days afterwards the abscess was opened, and 8 oz. of very fœtid pus were evacuated. This was, however, followed by erysipelas, and as his breathing became difficult the left chest was aspirated, and 40 oz. of pus removed.

Post-mortem examination.—It is stated that there "was contraction of the descending colon and an abscess in the abdominal walls," but the notes on this point are very scanty. "There was also an irregular contraction of the stomach around a point midway between the cardiac and pyloric ends, and at the base of this a circular depression which was adherent to the left lobe of the liver. External to the adhesion there was a small abscess below the stomach, left lobe of liver, and diaphragm. The stomach was much thickened around the ulcer, and an abscess the size of a hen's egg was situated below the capsule of the spleen. The left pleura contained pus."

In the next case the obscurity of the initial symptoms and the discovery of an inflammatory tumour in the pelvis seem to have led at first to a diagnosis of pelvic peritonitis.

CASE 12.—A single woman, æt. 18, was admitted into the Royal Hospital, Sheffield, on 30th March 1898, under the care of Dr. Hall. The menses began when she was 15, but since that time she had seen nothing. When 13 she had inflammation of the bladder and pain on micturition. For the last six months she had had pain on micturition. For three years she had suffered from indigestion, with pain and vomiting after food, for which she had been treated for the last few months. Both her parents died of consumption. About the second week in March she fell downstairs and hurt her left side badly, so that she was forced to go to bed for five days. After this she got up and tried to work, but was unable to do much. On 25th March she had acute pain in the left side, and took to bed. On 28th March she complained of difficulty of breathing, vomiting, and diarrhœa.

On 29th March her condition was as follows: Anxious expression, bright flush on both cheeks. Tongue moist, coated down the centre. Respirations, 34; pulse, 120; regular, small volume; temperature, 101°·2. Abdomen much distended all over, tender and tympanitic. Diarrhœa, motions not light-coloured. Small swelling felt in left iliac region about the size of an orange, indistinct and tender. *Per rectum*—Ill-defined tender swelling in front and to the left of bowel. Chest—cardiac impulse fourth space behind nipple. Respirations entirely thoracic; the diaphragm did not move at all, so far as could be seen. Impaired movement of left base with well-marked dulness behind for about two fingers'-breadth. Diminished entry of air into left side of chest. Tympanitic resonance right up to cardiac impulse in front and in axilla. Friction sounds over left base in front. Some rhonchi in right lung. Frequent cough, often very harassing; slight mucous sputa. Urine, 1024; faint cloud of albumin. Belladonna fomentations and morphia internally were prescribed, which relieved the pain and distension considerably. The temperature and other symptoms continued much the same, the cough troubled her a good deal, but the abdominal pain and swelling became considerably less. On 8th April, about 8.30 A.M., she was seized with severe dyspnœa, and began to expectorate large quantities of gruel-like, highly offensive, purulent matter. The distress of breathing became very great, and she gradually became cyanosed, and died of respiratory failure about three hours later.

Autopsy.—A large subphrenic abscess was found below the left wing of the diaphragm, due to the perforation of a chronic ulcer near the centre of the lesser curvature. The left lung was firmly adherent to the diaphragm, which had been perforated during life and had allowed some of the pus to escape into a bronchial tube. The pelvis contained a large abscess on the left side, the walls of which were formed by matted intestine, and by adhesions between the uterus, intestine, and broad ligament.

Occasionally *pylephlebitis* takes place, with the formation of secondary abscesses in the liver. The symptoms of this complaint are often masked by those of the primary disease, but as a rule severe pain is complained of in the right hypochondrium, followed by jaundice. The liver rapidly increases in size, repeated rigors occur, and death ensues within a few days. In some instances pyæmic abscesses develop in the lungs, or a murmur becomes audible over the mitral area of the heart owing to acute endocarditis.

The rupture of the abscess into the pleural cavity is usually accompanied by sudden pain in the chest, extreme dyspnœa and collapse. In one of our cases the accident was ushered in by repeated rigors, while in two others the patients felt that something had given way in the chest. In one instance death ensued within a few hours from shock.

The physical signs of this condition vary considerably. If the subphrenic abscess contains much gas, the initial phenomena will be those of pneumothorax; but in most cases the gas becomes rapidly absorbed, and the accident is followed by the signs of empyema. When the lung is adherent to the diaphragm, and the abscess finds its way directly into a bronchial tube, the patient experiences a sudden pain and expectorates a large quantity of pus (Case 11). If life is prolonged, coagulated milk and other particles of food may appear in the sputa.

In all cases where the abscess bursts into the *pericardium*, the initial symptoms are sudden pain over the præcordium and urgent dyspnœa. The pulse is very small and rapid, the extremities become cold, and the patient exhibits great restlessness. If, as is usually the case, the perforation is very small, acute pericarditis is set up, and a loud friction sound may be heard over the region of the heart. If, however, a large quantity of gas finds its way into the sac, the præcordial dulness is replaced by hyper-resonance, and the heart sounds either become inaudible or acquire a metallic character; while in those cases where the pericardium is filled with pus, the ordinary signs of pericardial effusion manifest themselves. As a rule the patient dies from cardiac failure within four days of the accident.

In those rare instances where the abscess bursts into the *colon*, there is a sudden access of pain in the abdomen, followed by the evacuation of pus, a fall of temperature, and relief of the pain. In the following case hæmorrhage seems to have ensued:—

Case 13.—A woman, æt. 48, was seized, whilst eating her luncheon on 2nd May, with a sudden violent pain in the epigastrium, cramp-like in character, which lasted with intense severity for half an hour, during which period she felt sick, but did not actually vomit. Previous to this attack she had always enjoyed good health, and had never been troubled with pain or sickness after food. She was put to bed, and on the 8th or 10th of the month diarrhœa set in. During this time, although she occasionally vomited, she was able to take her food without any increase of the pain. The diarrhœa continued until her admission into the hospital on 2nd June. She was then very thin and anæmic. She lay upon her back or left side, as it was painful to recline upon the right side. The temperature was almost normal. The liver was much enlarged, and near the umbilicus an indefinite tumour could be detected. On 3rd June she passed about 6 oz. of blood with the stool, and on each of the two succeeding days voided about the same amount, after which she died.

Autopsy.—An abscess was found situated between the enlarged liver, the anterior abdominal wall, and the coils of intestine. The abscess communicated with the transverse colon and the duodenum. The aperture in the colon was close to the hepatic flexure, was only large enough to admit a small probe, and was apparently of recent origin. That in the duodenum was upon the posterior wall, was circular in form, as large as a sixpence, and had smooth edges. At the middle of the lesser curvature of the stomach was a large chronic ulcer, whose base was adherent to the liver.

Dr. West, who records the case, remarks that the sudden illness of the patient is probably to be explained by the rupture of the duodenal ulcer and the consequent formation of the abscess. The abscess eventually burst into the colon, and its rupture probably explains the occurrence of blood in the stools during the last few days of life.

Rupture of the abscess into the *peritoneal cavity* is followed by collapse and general peritonitis (Case 2), while in those exceptional cases in which the pus perforates the stomach the accident is portrayed by the vomiting of large quantities of pus.

DIAGNOSIS.—When a patient who has suffered for some time from the symptoms of gastric ulcer is suddenly attacked by pain in the epigastrium and collapse, followed by tenderness over the upper part of the abdomen and fever, perforation of the stomach with localised peritonitis must be suspected. This becomes a certainty if, in addition to these signs, there is distension in the left hypochondrium, hyper-resonance or a bell-note over the front of the chest as far as the fourth rib, with tilting up of the apex of the heart, paralysis of the diaphragm, and signs of compression of the base of the lung. When, however, as in Case 1, there is no history of a previous gastric disorder, and a total absence of pain and physical signs in the abdomen, the diagnosis of perigastric abscess may be impossible.

In the early stages of the complaint secondary inflammation of the thoracic organs is very apt to divert attention from the primary disease, and several instances have been recorded in which the symptoms were erroneously ascribed to the presence of the pleurisy, pneumonia, or pericarditis. In all such cases, however, it may be remarked that the patient appears to be more profoundly ill than the physical signs seem to warrant, and that he often exhibits the pinched and septic appearance which is so characteristic of peritonitis. It is also noteworthy that the signs of the thoracic complication differ in several respects from those which accompany the usual forms of inflammation of the pleura or lung. Thus in every instance the percussion note over the front of the chest is tympanitic, the apex of the heart is pushed upwards or towards the affected side, while the signs of pleurisy or pneumonia are often confined to the back of the lung. It is also to be observed that there is marked rigidity of the abdomen, with some degree of swelling of the epigastrium and left hypochondrium, and great tenderness upon pressure.

The diagnosis of subphrenic suppuration from empyema can usually be made by attention to the following points:—In the former complaint the heart is pushed upwards, there is resonance in front and dulness behind, the *bruit d'airain* can often be obtained, the respiratory sounds are audible over the back of the chest, and tactile fremitus may be increased. In empyema, on the other hand, there is dulness on percussion both before and behind, the apex of the heart is displaced to the opposite side, and the breath sounds, vocal resonance, and tactile fremitus are absent over the dull area.

When the subphrenic abscess is accompanied by effusion into the pleura, the diagnosis is rendered much more difficult, especially if the introduction of a needle has shown the existence of pus. In this condition, however, it may be observed that the outflow of the pus is accelerated by inspiration, owing to the compression of the sac by the downward movement of the diaphragm, while the reverse is the case in ordinary empyema. In some of the recorded cases, the surgeon was surprised to discover clear fluid in the chest when he expected pus, and this led to a more careful examination of the case; while in others the discovery of clear fluid above and pus at a lower level indicated at once the existence of two effusions separated from one another by the diaphragm.

In a few instances the disease has been mistaken for simple pericarditis, owing to the existence of a pericardial friction sound. As a rule, however, the tympanitic resonance over the front of the chest, with deficient movement of the base, and the swelling and tenderness of the epigastrium, are sufficient to indicate the coexistence of subphrenic mischief.

When the cavity is large and contains both gas and pus, it is very apt to be confused with pyo-pneumothorax. In the last-named disease, however, there is usually a history of cough, dyspnœa, hæmoptysis, and of other symptoms indicative of pulmonary disease; whilst in perigastric abscess the patient has previously complained of pain after food, or dyspepsia. In pyo-pneumothorax the whole of the affected side is enlarged, the intercostal spaces are widened, and the movement of the ribs is annulled. In subphrenic abscess, only the lower part of the chest is distended and motionless, while the upper portion moves with respiration. In pyo-pneumothorax the heart is pushed towards the opposite side; there is hyper-resonance over the upper part of the chest, with dulness at the base, which varies with the position of the body; while the respiratory sounds are either absent altogether, or amphoric breathing can be heard over the resonant area. In subphrenic abscess the heart is pushed upwards; there is tympanitic resonance over the front of the chest as far as the third or fourth rib, and posteriorly the note is dull in any position the patient may assume; the breath sounds are normal over the upper part of the chest, deficient or slightly tubular over the posterior base; while, anteriorly, amphoric breathing can often be heard as far down as the level of the umbilicus. In both diseases the *bruit d'airain*, the succussion sound and metallic tinkling, may be obtained, but in perigastric abscess they are audible over the upper part of the abdomen as well as over the chest.

When perforation of an ulcer near the pylorus gives rise to gradual extravasation of the gastric contents, the acute pain in the epigastrium, with vomiting and fever, are apt to be mistaken for biliary colic. The latter affection, however, is far more common in women than in men, while the converse is observed in the gastric complaint. The fever in subphrenic abscess continues after the immediate symptoms have passed away, the pain is constant, jaundice is usually absent, and the signs of thoracic complications soon make their appearance. It must be remembered, however, that suppuration around the gall bladder is not an uncommon cause of subphrenic abscess, but in such cases the sac contains no gas. Osler has recorded an instance of perinephritic abscess which perforated the colon, and gave rise to a gas-containing cavity beneath the diaphragm.

When a perigastric abscess devoid of gas has formed a palpable tumour, it may be mistaken for a hydatid cyst in a state of suppuration. But the history of a hydatid cyst is very characteristic: it is often discovered by accident, and has generally been unattended for a considerable length of time by pain or any other inconvenience, excepting such as may arise from its bulk; there has been no previous emaciation or deterioration of the general health, and neither pain after food nor vomiting. A hydatid tumour is always dull on percussion, is not lessened by diarrhœa or vomiting, can be generally shown to be connected with the liver, and, unless adhesions have been extensively formed, it moves with the respiration and upon pressure.

A perigastric abscess may also be mistaken for an hepatic abscess, unless it is borne in mind that the latter almost always arises from dysentery or an affection of one of the abdominal organs whose circulation is connected with the portal system. It chiefly occurs in persons who have lived in the tropics; its course is acute, and is usually attended with repeated rigors; the tumour is quite dull on percussion, and is never accompanied by signs of pneumothorax.

TREATMENT.—As soon as the existence of the abscess can be determined, the cavity should be opened and drained; for every day that the operation is postponed increases the risk of secondary inflammation of the thoracic viscera and perforation of the diaphragm. The abscess is most conveniently opened in the left hypochondrium, care being taken not to disturb the adhesions between the stomach and the abdominal wall, which prevent extravasation into the general cavity of the peritoneum. When the pus is situated in contact with the diaphragm, a counter-opening may be made between the ribs behind, in order to secure free drainage.

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PATHOLOGICAL AMENORRHŒA FROM OTHER THAN CONSTITUTIONAL CAUSES, WITH ILLUSTRATIVE CASES.

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In the absence of pregnancy and deteriorated constitutional states, amenorrhœa is by no means a common condition.

From a general point of view it may be classified as of two types, primitive and acquired; and from a physiological aspect each may be considered as due to—(1) Atresia of the canals; (2) uterine conditions; (3) ovarian conditions.

Under the first heading of atresia we may have the block to the exit of the menstrual fluid, situated either in the cervix (atresia cervicis), in the vagina (atresia vaginalis), or at the hymen (atresia hymenalis); this last type may be considered as a variety of atresia vaginalis, but from the differences in its clinical signs it is usually described separately.

I shall merely relate an example of each of these varieties which has come under my notice.

Case 1.—*Atresia hymenalis.*—K. W., æt. 15, had complained of severe periodic monthly pain for about nine months, which latterly had become more or less constant. She had never menstruated. On examination, a slightly bulging mass projected from the vulva, and per rectum the pelvis was felt to be filled by a fluid swelling, most distinctly felt through the anterior rectal wall. The treatment consisted of excision of a portion of the bulging hymen, through which the tarry, retained menstrual fluid was allowed gradually to drain into cotton-wool for forty-eight hours. After this time antiseptic vaginal syringing was adopted. The patient is now the mother of two children.

Case 2.—*Atresia vaginalis.*—J. D., æt. 14, complained of a right-sided abdominal swelling about the size of a cocoanut, and also gave the history of having suffered from paroxysms of pain of an irregular nature for nearly a year. Menstruation had not occurred. Examination showed vulva well developed, but no introitus vaginæ. Rectal examination elicited a fluid swelling bulging through the anterior wall about 1½ in. from the anus; the swelling was continuous with the abdominal tumour. The diagnosis being clear, a careful dissection was made, commencing between the anus and urethral orifice. Two loculi were opened into, from each of which escaped a small quantity of thickish yellowish fluid. The lower extremity of the large cyst was then incised, and a thickish glass tube inserted. By this means a large quantity of thick tarry fluid was allowed to drain for forty-eight hours; after this the patient was again anæsthetised, the previous opening was then enlarged, and the cavity washed out with 1–40 carbolic. Into the canal was now fixed a large crystal dilator, which was worn for two months.

The patient was operated on five years ago, and has menstruated regularly ever since. Vaginal examination, however, now shows great contraction of the upper portion of the canal, which with difficulty admits the tip of my forefinger.

It will be noted that, in the evacuation of the contents, slow drainage was employed in preference to immediate emptying and thorough washing out, as I considered by this means a safer adaptation of the distended organs would occur, and thus the danger of tearing possible adhesions to surrounding structures would be minimised. I need hardly add, the strictest antisepsis was enforced.

Case 3.—*Atresia cervicis.*—B. M., æt. 24, was sent to me by Dr. Haddow of Govan. She complained of having for the last seven years suffered from irregular attacks of pain of a severe nature, situated in the lower abdomen, and chiefly in the right side. Menstruation had not appeared. On vaginal examination, the vagina and vulva appeared normal, the cervix was small and conical, and into it the sound could scarcely be passed an inch. Bimanual examination showed the pelvis to be occupied by a very tender, indistinct, adherent mass, particularly prominent on the right side. The diagnosis made was enlarged, and adherent Fallopian tubes and ovaries, with an atrophic uterus, and removal of the appendages by abdominal section, was undertaken.

The abdomen when opened showed evidence of previous general peritonitis, and the intestines and omentum were found adherent to the anterior parietes. The pelvic swelling was found to be composed of a uterus unicornus. The right horn was very rudimentary, and distended with a tarry substance, while between the layers of the broad ligament a considerable amount of the same tarry material was found, as if it had escaped from rupture of the distended uterine horn. The ovaries on both sides were much enlarged, and showed signs, from the number of blood cysts and extravasations in their substance, of intense congestion. They were embedded in the pelvis by strong inflammatory adhesions. By careful dissection they were enucleated and removed, and the rudimentary horn was divided as near the larger horn of the uterus as possible, and the contents evacuated. The edges of the sac were then invaginated and stitched together with a continuous suture, and over all the peritoneum was drawn and carefully stitched. The extravasated blood between the layers of the broad ligament was carefully washed out, and the upper edges of the ligament stitched together. As can be surmised, the operation was prolonged and tedious, but the patient, a strong, healthy girl, recovered without an untoward symptom.

The case in its essential characteristics simulates in some degree that described by Dr. Lackie to the Society, and which through his courtesy I had the pleasure of closely observing. In his case, however, the uterus was in a more forward state of development, and the patient menstruated regularly from one horn.

The only feature of special interest in these cases, generally, was the irregularity of the pain complained of. In Case 1 it was markedly periodic, and occurred at monthly intervals, but in Cases 2 and 3 there was no periodicity, long periods were present between the paroxysms; a circumstance which tended greatly to obscure the diagnosis, and in Case 3 closely simulated recurrent attacks of appendicitis.

Of more general interest, from their greater frequency, are those cases of amenorrhœa due to functional inactivity of the uterus and ovaries. In fact, it is questionable if the cases already quoted are true examples of amenorrhœa. They may be properly described as examples of concealed menstruation.

Absence of menstruation, whether primitive or acquired, must, in the present uncertain state of our knowledge of the physiology of normal menstruation, be surrounded with difficulty of explanation. But there are certain known facts which, from a practical standpoint, are of importance in the elucidation of this difficult subject. In the first instance, it is incontrovertible that the ovaries are essential for the institution of the menstrual function; want of development of these organs is always attended with amenorrhœa. In like manner, it must be admitted that a totally undeveloped uterus is always associated with a similar condition. *A priori*, then, one must assume that menstruation is instituted by the development and functional activity of both organs. Development of either alone is insufficient. Puberty may be defined as a phase in female life, associated among other things with principally the development of the sexual organs and instincts. Normally, they are developed coincidentally, but are quite independent of each other. Thus we may have pathological states resulting from irregular development. The imbecile may be developed in her sexual organs as a veritable Hebe, yet at the same time be utterly devoid of sexual instincts. In like manner, sexual instincts may be acute in women totally devoid of functionally active sexual organs.

Further, well-developed functionally active ovaries may be present without any development of the uterus, and *vice versâ*.

In these last instances primitive amenorrhœa is present, as evidenced by the following cases:—

Case 4.—M. F., æt. 25; never menstruated; complained of irregular severe pain in lower abdomen, which had lasted for several years, and incapacitated her from working. On examination, the cervix uteri was found to be extremely small, while each side of the pelvis was occupied by an exceedingly tender matted mass. Abdominal exploration by laparotomy showed an extremely small uterus, about the size of a filbert nut, and on either side an adherent irregular purplish mass. These were removed, and, on examination, were found to be large, congested ovaries and distended Fallopian tubes. Since their removal the patient has been entirely relieved from pain, and is now working steadily. The presence of blood in the Fallopian tubes is of interest in regard to tubal menstruation.

Case 5.—F. G., æt. 27, married three years; sterile, never menstruated; consulted me regarding her sterility and absence of menstruation and leucorrhœa. On examination, the uterus appeared normal, sound passed 2¾ in., no ovaries could be palpated. All forms of treatment proved unavailing in instituting menstruation.

In Case 1 we have a typical example of want of uterine development as the cause of amenorrhœa, while in Case 2, which is one of several similar that have come under my notice, it is probable undeveloped ovaries were the cause of the absence of menstruation.

Another class of case of primitive amenorrhœa, of which I have seen several examples, is more difficult to explain, namely, where, as far as can be recognised by examination, both ovaries and uterus are apparently normally developed in so far as size is concerned.

A striking example of this class I saw with Dr. Milne Murray, the patient being a particularly well-developed girl of 22, in whom the ovaries were palpable and appeared normal in size, while the uterus admitted the sound for 2½ in., and in shape and consistence appeared normal also.

The cause of the abeyance of the menstrual function here (assuming that the size of the ovaries and uterus shows development) can only be looked for in the hidden precincts of that great unknown, namely, central nervous system. There is probably here present a much greater influence on the regulation of sexual functions than is generally credited, as we will later see in discussing acquired amenorrhœa.

To the practical physician, cases of primitive amenorrhœa, though doubtless interesting, are from a clinical standpoint unsatisfactory, in so far as successful treatment is concerned. Want of development of an organ, be it organic or functional, is usually beyond the scope of therapeutics. By removal of the organs, as in

Cases 2 and 4, the pain and suffering can be removed; but this is not curing the primary disease, it is merely removing the secondary manifestations. In some instances, however, treatment may be attended with success. These cases are met with as the result of long-continued anæmia and constitutional debility in early womanhood, where, after the anæmia has been cured, a permanent want of functional activity of the organs remains. Much may here be attained by the judicious use of electricity, so long as the organs show little want of development physically. These cases, however, are closely allied to acquired amenorrhœa, under which they will be more satisfactorily described.

Acquired amenorrhœa.—Inactivity of the sexual organs, so far as concerns menstruation, may be the result of impairment of the functions of the ovary, uterus, or controlling nerve centre.

Perhaps the most frequent is the last, and it is one which is too often overlooked. That the sexual organs are intimately associated with and controlled by nervous impulses, is supported beyond controversy; as examples might be quoted, the amenorrhœa of fear after illicit intercourse, the effect of a sudden shock, the inertia which follows depression during labour, or the stimulating action on labour pains of encouragement. Many other examples might be mentioned.

It is to this cause that the delayed or suppressed menstrual function, so frequently noted in girls the subjects of over-study, is probably due, as evidenced by the beneficial effect of prolonged rest from work. It is perhaps not too much to anticipate that the "new woman," in her competition with man, may in due course propagate a race of feminine individuals, who will still further imitate the male by having the menstrual function entirely suspended. Fortunately, however, apprehension on this score is unnecessary, as from want of functional activity in these organs further propagation will be impossible, and the anomaly cease.

Permanent absence of functional activity in the ovaries and uterus, with resulting amenorrhœa, may be induced by a prolonged period of enforced cessation of the menses, through anæmia and other enfeebled constitutional states. The uterus, previously well developed and active in these cases, may from its inactivity become atrophied and small, and the ovaries more or less inert, and it is here that some benefit may be derived from treatment. A similar condition may be met with without any known cause. As an example of several of such cases I have met with, the following may be quoted:—

CASE 6.—Mrs. Y., æt. 25, married four years; no family, one miscarriage a few months after marriage, was sent to me by Mr. Hudson. She complained of amenorrhœa and sterility, the former having lasted for eight months; for a year previous to that time the menses had steadily diminished in amount. She looked and felt in perfect health, and had always been so.

Vaginal examination showed the uterus and ovaries to be apparently normal; the sound, however, entered the uterus slightly short of 2½ knob. Treatment by the intra-uterine application of electricity, negative pole (Apostoli), was adopted. After four applications, menstruation returned. One period only occurred, the subsequent one was arrested by impregnation, which resulted in the birth of a healthy child.

Acquired amenorrhœa may be also due primarily to want of ovarian activity alone. In these cases the uterus remains for a time, at any rate, normal in size, but in due course diminishes from secondary inactivity. I have here found treatment by ovarian extract in several cases entirely successful, after absolute cessation of menses had been present for more than a year. Particularly beneficial, however, have I found this method of treatment in relative amenorrhœa, where, though not entirely absent, the flow was scanty and the patients suffered from plethora and obesity. One marked case was sent to me by Dr. Simla Paterson, and is worthy of mention.

Case 7.—Mrs. P., æt. 29, no family; complained of headaches, flushings, great obesity, and scanty but regular menstruation, which for the previous year had lasted for only a few hours each period. She weighed almost 15 stones. Bimanual examination being impossible, the sound was used to examine the uterus, and it was found to pass quite 2½ in. Treatment by ovarian extract was adopted. In the course of ten days a profuse uterine hæmorrhage occurred, accompanied by complete relief of the headache and lassitude. The periods occurred regularly, were most profuse, and lasted over a week, and in three months she had diminished in weight 2½ stones.

Typical cases, such as those I have detailed, cannot but incline one to the view that amenorrhœa may be caused by simple inactivity of the ovaries or uterus, independently of one another. That the organs are in close sympathy with each other there can be no doubt, as is evidenced by the very general though not absolutely certain cessation of menses and atrophy of the uterus following oöphorectomy, which demonstrates the ovarian influence on the uterus. What the action of removal of the uterus on the ovaries is, has yet to be determined.

From this intimate functional connection with each other, a cessation of activity in one would appear to tend towards a similar condition in the other secondarily, and thus a complete incurable condition of amenorrhœa results, or, in other words, a premature menopause occurs. The question of premature climacteric is of great interest in this connection. The normal menopause may be defined as a phase in female life, associated with the cessation of uterine and ovarian functional activity, and subsequent atrophy. Usually this is coincident, but not necessarily so, as evidenced by the prolonged periods of flushings, headaches, and molimia, after cessation of the actual uterine discharge. The cause of this normal change is as yet one of nature's unfathomable problems, which, as usual in similar conditions, directs one's thoughts to the equally hidden mysteries of the central nervous system. It must be looked upon, however, as indeed all nature's handiwork is, as desirable and irrevocable. Attempts to delay its accomplishment would be as futile as to stem the flowing tide.

Early or premature menopause, on the other hand, must not, however, be viewed in the light of the inevitable, and accepted with folded hands. Although, doubtless, some of these cases may be due to nervous origin, similar to the normal process, and thus beyond treatment, others must be considered as merely examples of want of functional activity in the ovaries and uterus, which, as has been already shown, can be treated if desired with a reasonable hope of success. Here, as has been indicated, the sooner treatment is adopted the more likely is it to be beneficial, as continued inertia tends towards atrophy and secondary changes, which are incurable.

Treatment.—There can be no doubt that in acquired amenorrhœa much may be done in the way of re-establishment of menstruation, as evidenced by the typical cases I have cited.

Uniform success cannot be expected, and repeated failures may have led to treatment being in so many cases unattempted. Further, in many instances it may be open to discussion whether attempts to restore the function are worth while, should the patient describe herself as in good health otherwise. Most women, however, are extremely apprehensive over the absence of their periods, and it is usually poor consolation to assure them of it being a function unnecessary either for life or complete health.

Haphazard treatment is at all times unsatisfactory; cure or failure in one case gives no clue to proceed on with regard to its successor. Until within recent years the galvanic intra-uterine stem was the almost universal treatment adopted, irrespective of the factor in the causation of the disease. The benefits derived by this means were so uncertain, and were obtained at such a risk of peri-uterine inflammation, that it is little wonder that it was generally decided to leave cases alone, and even at the present time there still remains the same disposition among many of the profession. From the medical practitioner's personal point of view, if the patient is otherwise in good health, this attitude is commendable; but should it be the patient's desire, as it so often is, that if possible the function be restored, it is our duty, should there be any reasonable hope of success without any risk to the patient, to treat her accordingly. It is principally with this object, of as far as possible placing the methods adopted on definite lines, that I have brought these observations before you.

Recognising, from what has already been stated, that the condition may be due to defective function of the uterus or ovaries, alone or together, one must as far as possible first determine which organ is primarily at fault. Defective uterine function is usually associated with diminution in the size of the organ, so-called superinvolution, while in ovarian inactivity of not too long standing the uterus remains more or less normal in size. According, therefore, to the size of the uterus, our line of treatment must vary.

Uterine activity can undoubtedly be very forcibly stimulated by a continuous electric current of 40 to 60 milliampères, the negative pole being inserted into the uterine cavity. That electricity stimulates uterine activity has long been known, and treatment in this direction by the galvanic stem and the faradic current, passed through the lower abdomen, has for many years been adopted. This mode of electrical treatment I have, however, found extremely unsatisfactory, and have consequently abandoned it. On the other hand, with the constant current applied as described, the success I have noted certainly warrants its continued trial.

Where, apparently, ovarian inactivity is the cause of the condition, I have adopted treatment by means of ovarian extract. In these cases the results have been very irregular, but on occasions strikingly successful (see Case 6).

That ovarian extract has a specific action of a beneficial nature, in certain instances, where, after removal of the ovaries, vasomotor irregularities cause marked symptoms, I am quite convinced from observations on many cases. The flushings and headaches, which in those cases are such disagreeable sequelæ to this operation, can frequently be relieved. What the exact physiological effect produced is, so far is unknown, but it would appear that an analogous agent usually present in ovarian activity is absorbed into the system. We must therefore infer that the active principles of ovarian secretion remain unchanged in the extract, and can thus be administered. That this agent is intimately associated with menstruation, is supported by the recurrence of that function, in some cases of amenorrhœa, where the extract has been given. Of three cases in which I have successfully treated amenorrhœa by this means, none have subsequently become pregnant; in two of these only, menstruation continued after the extract had been stopped. It is doubtful, therefore, whether any recurrence of ovulation was attained. Though the results thus acquired have been but partially successful, they seem to warrant future attempts. Particularly beneficial, however, is the use of ovarian extract in diminished menstruation, where the woman suffers from obesity and symptoms of full-bloodedness. In some instances the flow is markedly increased along with amelioration of symptoms, in others the symptoms are relieved without any appreciable change in the amount of the flow; also, in cases where the completion of the climacteric is irregular. When the cessation of menstruation is associated with similar manifestations of plethora, ovarian extract may often be given with much benefit. The adoption of this method of treatment, even if unsuccessful, has the advantage of the fact that it is entirely harmless, 40 grs. daily may be administered without untoward symptoms, while the usual dose necessary is only 15 grs. per diem.

In justification of the treatment on the lines I have described, I may here mention the results I have obtained. In seven cases of acquired amenorrhœa, from apparent uterine cause, three were absolutely successful: menstruation was permanently re-established, and two of these subsequently have borne children. One case was only temporarily cured, the remaining three being complete failures. In seven cases treated by ovarian extract, two were permanently successful, and one temporarily so, in restoring the function; none, however, have become pregnant subsequently. In all the fourteen cases treated, menstruation had been absent over six months. In one of the cases cured by ovarian extract, intra-uterine electrical treatment was also employed.

I have on five occasions extended the treatment to cases of primitive amenorrhœa; in one of these only has success attended my efforts. As this woman, however, was only 21 years old, though married three years, the case cannot be looked upon as of much weight, as it is possible it was merely an example of delayed menstruation.

All the uterine cases treated were married women. So far I have maintained an attitude of entirely refraining from local treatment for amenorrhœa in the unmarried. Whether this attitude, from purely sentimental reasons, is justifiable, may be questionable; but from the uncertainty of results, due probably to our inability to diagnose the true cause of the disorder, I feel the time has not yet arrived when sentiment can be thus rudely set aside.

From what has been attained by the methods adopted in married women, however, I cannot but maintain that cases of so-called superinvolution or early climacteric should not be accepted as inevitable and incurable, and treated accordingly with folded hands. Should the patient desire that an attempt be made to restore the lost function, a reasonable chance of successful treatment may be held out on the lines I have indicated. It might be that by the judicious use of the negative pole, or even ovarian extract, a peerage might owe its direct succession, and the death duties on the family acres reduced to a third. In any case the restoration of a function so dear to the woman of middle life, if it can be attained, is desirable to attempt. In conclusion, I might be allowed to emphasize the following—

1. That acquired amenorrhœa may be due to functional inactivity of either uterus or ovaries alone, and may in these be treated effectively.

2. That treatment is to be directed along lines indicated by the dimensions of the uterus.
3. That the lines thus indicated are uncertain, from the influences of the central nervous system, which may be the primary cause.
4. That, from the fair amount of success obtained, treatment is justifiable, and should be attempted if the patient so desire.

REFLEX SALIVATION FROM ABDOMINAL DISORDERS.

By F. Parkes Weber, M.D., F.R.C.P., *Physician to the German Hospital, London.*

The normal[1] flow of saliva on eating may be partly excited by psychical causes, and partly reflexly by stimulation of the mucous membrane of the mouth and stomach. Everyone knows that the mouth of a hungry person may "water" at the smell, sight, or even thought of savoury food. The reflex flow of saliva from stimulation of the gastric mucous membrane is perhaps a little less clearly proved, for in some of the experiments made on this subject the flow of saliva, apparently excited by placing food in the stomach, might possibly have been of psychical origin, the animal or human being in question having seen or smelt the food. Thus Milner Fothergill[2] mentions that Gairdner, in a case of severe cut-throat, found that the presence of food in the stomach, without any possible action on the mucous membrane of the mouth, caused a distinct flow of saliva. However, even if the possibility of the psychical origin for the salivary discharge in such cases has not absolutely been excluded, one will hardly doubt that a flow of saliva can be induced reflexly by stimulation of the gastric mucous membrane. At all events, in disordered conditions, the connection between a flow of saliva and gastric disturbance is often very obvious. An intense discharge of saliva may in some persons precede the vomiting in sea sickness and mountain sickness, and in nausea due to dietetic errors, etc. J. P. Pawlow[3] suggests that this may be the reason why some people loathe the sight of spittle. In some so-called cases of "pyrosis" the watery fluid complained of is probably saliva, whether it flows from the mouth or is brought up from the stomach. Clifford Allbutt[1] gives two cases in women, æt. 35 and 41 respectively, where clear water was either vomited or ran from the mouth; in the first of these cases there was likewise expulsion of inoffensive wind. The salivary flow in similar cases may be a reflex result of gastric irritation, even if only occurring in peculiarly susceptible (*i.e.* "neurotic") individuals, and may doubtless, in some persons, be remedied by the same measures as those employed for the cases accompanied by pain, described originally by Cullen.[2]

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[1] It is not always easy to draw a sharp line between what must be regarded as a normal flow of saliva, and what must be regarded as abnormal. For instance, salivation during dental operations is common enough, but the facility with which it is induced certainly varies much in different individuals, and probably in the same individual at different times. The relative facility with which excessive salivation is induced may be compared to the relative liability to vomit, which varies much in different individuals, and in the same individual at different periods. Some persons vomit from very slight causes, from slight gastric disturbance, from indulging in a very copious meal, from merely tickling their throats, or from running quickly upstairs after a rather full breakfast. In other persons vomiting is of excessively rare occurrence, and if desired can only be obtained with relative difficulty by the use of strong emetics.

[2] Fothergill, "The Practitioner's Handbook of Treatment," 4th edition, London, 1897, p. 31.

[3] "Die Arbeit. der Verdauungsdrüsen," German translation from the Russian, Wiesbaden, 1898.

I will now describe the paroxysmal attacks of salivary flow to which a fairly healthy man of about middle age has occasionally been liable. During the attacks a hot stream of the tasteless liquid fills the mouth, and, especially if the patient attempts to swallow it, there may be likewise an uncomfortable sensation in the throat, and a tendency to bring up wind without any real feeling of nausea. The general feeling of distress may, however, be very great during the attack, especially if the patient has to walk or even keep on his feet when thus affected. The attacks are mostly induced by exercise after a rather full meal. Thus, at school, a game at football after the ordinary midday meal was apt to induce an attack. Somewhat later on in life, bathing and swimming in a river after coffee in the afternoon sometimes led to an attack. Similar paroxysms were also induced by mountain climbing, etc. In this patient's case there can be no doubt that exercise when the stomach was loaded was the most obvious exciting cause of the abnormal salivary flow. Indeed, whilst at school, he found out for himself that the salivation when playing football could be prevented by great limitation of the midday meal, especially in regard to pudding and fluid. Abstention from liquids and puddings, a great trial for him, would with certainty save him from an attack, whilst, on the other hand, any digestive disturbance predisposed him to an attack; and when this predisposing cause was present, a large meal was sometimes capable of bringing on a paroxysm, even when not followed by any violent exercise. The most important point in this case is the treatment which the patient discovered for himself. Not only did he discover the preventive treatment, as already mentioned, but he found out also how he could put an end to the attack. This was almost immediately effected by the patient lying down, wherever he could do so, perfectly flat on his back. Sitting in a chair was not sufficient, but lying down at full length on his back gave sure relief, though, to prevent recurrence of the attack after rising up again, the supine position had to be maintained for about a quarter of an hour or more, the length of time varying doubtless considerably according to the severity of the attack.

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[1] "Goulstonian Lectures on Visceral Neuroses," London, 1884, p. 43.

[2] See Sir Thomas Watson's "Lectures on Medicine," 4th edition, London, 1857, vol. ii. p. 475. Allbutt, however, in his recent article on "Neuroses of the Stomach" ("System of Medicine," 1897, vol. iii. p. 472), says that he has failed to find any cases which can be regarded as examples of the pyrosis described by Watson.

This patient presented at times symptoms of atony or dilatation of the stomach, and, on the whole, by far the most reasonable explanation of these attacks seems to me to be the following. I think that in the upright and sitting position the stomach, already perhaps too much distended, was pulled downwards by the weight of its contents. This I suppose caused undue irritation or stretching of the nerve filaments, and thus, by reflex action, brought on the salivation. It is possible that the weight of the stomach and its contents may in the severest paroxysms have led to great dragging on the duodenum (perhaps with temporary kinking or occlusion of the pyloric orifice of the stomach), thus giving rise to still greater reflex nervous irritation. When the patient lay down at full length, the dragging of the stomach was naturally obviated, with the result that the reflex salivation ceased almost immediately. Anyhow, it is clear, I think, that mere irritation of the gastric mucous membrane was not the cause of the salivation.

I believe that this case is of importance, because it shows that in cases of abnormal salivary flow the cause and proper treatment may differ widely in different cases. Each case must be separately studied. It is also interesting to note that this patient's father was likewise subject to an occasional abnormal flow of saliva. In the father's case the paroxysms were associated with a feeling of choking or discomfort in the throat, and were predisposed to or induced by gastric disturbance. The saliva could hardly be swallowed, so copiously did it flow; but the attack would pass off spontaneously, in about ten minutes, without there being any necessity to lie down quietly, like there was in the son's case.

That there is a relation between reflex salivation and reflex vomiting is confirmed by some cases of pregnancy. Just as salivation without vomiting is a rare result in ordinary gastric disorders, so in pregnancy, whilst more or less vomiting is an habitual accompaniment of the early period, reflex salivation is of relatively rare occurrence, but may last a long time and be very annoying to the patient. Audebert[1] records a remarkable case of a woman who was attacked with salivation at an early period of pregnancy, in which the precise cause of the reflex disturbance was apparently quite unusual. The troublesome symptom grew worse, although there was scarcely any vomiting; until at about the middle of the third month of pregnancy the gravid uterus was found to be retroflexed. When the retroflexion was reduced, the salivation, which had reached 810 grms. in the day, rapidly diminished, and ceased entirely after three days.

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[1] *Gynécologie*, 15th December 1897, Abstract in the Epitome of the *Brit. Med. Journ.*, London, 29th January 1898.

Profuse salivation may sometimes occur in other abdominal disorders. Thus von Leube[1] mentions a case of cirrhosis of the liver, in which spontaneous salivation occurred, the patient secreting 3 litres of saliva in twenty-four hours, and a good deal in the following days; the ascites which was present disappeared, apparently owing to the profuse drain of fluid from the body by means of salivation.

Attacks of profuse salivation may occur in various disorders of the stomach and abdominal viscera, just as vomiting may, only much more rarely. As in the case of vomiting, so also in the salivary flow, the exciting causes may be very different in different cases; the causes must be carefully searched out, since on them depends the treatment to be adopted.

Many of these cases are examples, I believe, of what one may somewhat loosely term "mistaken reflex action." Ordinary reflex actions may be considered purposeful,[2] whilst what I term "mistaken reflex actions" are purposeless. When we sneeze, owing to the presence of particles of snuff or pepper having lodged on the mucous membrane of the nose, the obvious purpose of the reflex sneezing is to remove the irritating particles. When the pupils contract in a strong light, the obvious purpose of the reflex contraction is to shut out the superfluous rays of light from the retina. Some persons, however, have a tendency to sneeze when they look at a strong light, and this I should term an apparently "mistaken reflex action," because it is apparently purposeless.

It seems to me that, from this point of view, the various reflexes excited by abnormal irritation of the gastric and intestinal mucous membranes can all be explained as attempts to clear the alimentary canal of irritating matter. Vomiting, increased peristalsis, and excessive secretion from the bowel, stomach, and salivary glands, can all be explained in this way. They dilute any irritating material in the alimentary tract, and get rid of it upwards by vomiting and spitting, or downwards by diarrhœa. When these symptoms are the result of irritation in the alimentary canal, I would consider them as good examples of "apparently purposeful" reflex action, but when the same symptoms are reflexly induced by other abdominal disorders, I would generally consider them as examples of "apparently purposeless" or "mistaken" reflex action.[3]

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[1] *Phys.-Med. Verein*, Würzburg, 22nd June 1899.

[2] I use the terms purposeful and purposeless for convenience, but should more correctly say "apparently purposeful" and "apparently purposeless." I do not mean to imply that all normal phenomena of life must necessarily have a purpose. The apparent purpose of vital phenomena can, of course, be scientifically accounted for by the doctrines of evolution.

[3] An exception may possibly be made in regard to the above-mentioned case of

A tendency to some special kind of "mistaken reflex action," such as to sneeze when exposed to a strong light, or to suffer from a profuse flow of saliva from a pelvic disorder, may doubtless sometimes, like other nervous peculiarities, run in families.

Excessive and "apparently purposeless" reflex disturbances, in which no obvious exciting cause can be found (of which some cases of "hysterical vomiting" are probably examples) occur characteristically in "neurotic" subjects; in some of these cases, however, the "mistaken reflex action" may in reality be an example of undue spreading or "*irradiation*" *of the reflex result* of some relatively slight cause of irritation.

With regard to reflex salivation, a flow of saliva sometimes precedes or accompanies vomiting, and seems to be due to the "irradiation" of the reflex disturbance, caused by irritation of the walls of the stomach; in other cases, reflex salivation seems to take the place of vomiting, and may then be regarded as a good example of apparently "mistaken reflex action."

GASTRO-INTESTINAL SELF-INTOXICATION AS A FACTOR IN NERVOUS DISEASES.

By O. J. Kauffmann, M.D., M.R.C.P., *Honorary Physician to the Queen's Hospital; Visiting Physician to the Workhouse Infirmary, Birmingham.*

The idea of a toxic epilepsy, the toxic material being derived from within the body of the sufferer, is a perfectly familiar one; similarly, the notion of headache, insomnia, irritability of temper, and a number of other minor symptoms, as the results of self-intoxication, is fully and generally recognised, both in diagnosis and in the treatment of patients thus afflicted. Less familiar than these notions is the recognition of self-intoxication as a cause of insanity of various types; and still more infrequently does auto-intoxication present itself to our minds as a cause of organic nervous diseases.

My attention was some time ago arrested by a class of patients who presented, in addition to well-defined nervous disorders or diseases, facial appearances which pointed to their suffering also from disorders of digestion. All the patients in this class complained primarily of symptoms relating to their nervous systems. The facial appearance presented by them was one which I was accustomed to associate with gastro-intestinal disorders of one kind or another, and which always appeared to me to accompany the absorption from the bowel of abnormal bye-products of

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salivation where the ascites from which the patient suffered disappeared, apparently in consequence of the drain of fluid from the body by way of the salivary glands. In this case, however, the question is: Was the salivation undoubtedly a *reflex* result of the abdominal disease?

digestion. It is an appearance which is likewise met with in persons presenting well-defined signs and symptoms of permanent dilatation of the stomach, but it occurs only rarely in cases of constipation unassociated with subjective symptoms of gastric or intestinal indigestion — such as the constipation which we encounter in many anæmic and chlorotic patients.

In its fullest development this appearance is as follows: the complexion is sallow, the cheeks have a cyanotic tinge, erythematous patches, appearing rapidly and vanishing as quickly, are seen on the face, neck, and upper part of the chest. The small vessels about the nose and cheeks are dilated and visible, much as they are in a chronic alcoholic; there is often a tendency to acne and comedones, and the skin of the face is apt to be in a state of seborrhœa and to look greasy. The tongue is generally furred, in varying degree, and is occasionally very foul; the breath in these cases has usually a disagreeable acrid odour, and in some instances possesses the peculiar fermentative smell which is often encountered in conjunction with marked dilatation of the stomach. It was not in every member of the group that the appearance just described was found fully developed, but enough of this symptom-complex was always present to be very striking. More particularly the dilated vessels on the cheeks, when occurring in young persons, not given to alcoholic excess, were a noticeable feature.

The nervous diseases and disorders which I have found associated with the appearances just mentioned comprise the following cases, of which I have kept notes. The majority of these sufferers have been out-patients; and though I have reason to believe that many more cases of the same kind have passed through my hands, yet the circumstances have not permitted me to obtain notes of a greater number:—

Locomotor ataxia, three cases.
General paralysis, one case.
Melancholia, four cases.
Sciatica, one case.
Epilepsy, four cases.
Nightmare, one case.
Persistent vertigo, one case.

The fact that these patients complained of their nervous symptoms, while the facial appearance in each instance reminded me strongly of gastro-intestinal disturbances, led to the inquiry whether the digestive functions were normal or not. In every case they proved to be abnormal, the particular symptoms of indigestion varying a good deal. In some patients there was pain after food, in others flatulence, in others again vomiting or constipation; and the remoter nervous symptoms of gastro-intestinal disturbance, such as sleeplessness, dreaming, and nightmare, were also often admitted on questioning, and sometimes formed a prominent item of the patient's complaint.

The evidence of gastro-intestinal disturbance in these individuals was very striking, and did not by any means require minute inspection or particularly searching questions. It was plain to anyone approaching the case with an open mind, and a determination to find out all the circumstances belonging to it.

Here was, then, a group of cases of nerve disorder coupled with manifest disturbances of the gastro-intestinal processes of digestion (as distinguished from the processes of "interior digestion," or metabolism), the facial appearances indicating, moreover, the presence in the blood of a toxic substance which, in a certain proportion of the cases, led to neuro-vascular changes in the skin (erythema), and in some instances to permanent alteration of the cutaneous vessels. The foul breath and furred or plastered tongue, which occurred with great regularity in the group, constitute a familiar symptom in cases of blood-intoxication, whatever may be its source.

The question whether these patients presented any other evidence of toxæmia by absorption of poisonous matter from the alimentary canal, beyond the clinical appearances just described, could only be solved by examination of the urine, with which excretion the noxious material might possibly be removed from the body. To search for it in other excreta was impracticable.

On examination of the urine, it appeared that in each case indican was present in greater or lesser quantity, over considerable spaces of time, and invariably when the patients first came under observation, and in amounts greater than could, from actual comparison, be considered consistent with the urine of normal health.

Moreover, the urines were in these cases normal to the ordinary tests, and contained neither sugar nor albumin. This last point is perhaps important; at all events I have taken care to exclude from my list all cases in which albumin was present, fearing that urinary albumin might, independently of other conditions, yield indican.

Indicanuria occurs, broadly speaking, in three groups of cases, viz.:—

1. Cases in which there is absorption of abnormal bye-products of the digestion of proteid material;

2. Cases in which large purulent effusions lead to the entrance into the blood of some of the constituents of the pus; and

3. So far as my observation goes, certain cases of albuminuria, independently of conditions 1 and 2. It is possible that this third group of indicanurias is really in part due to the same cause as the first group. But there is some evidence, I believe, showing that indican may be developed by decomposition of the urinary albumin.

It is true that indican occurs not infrequently in the urine of those who are suffering from no symptoms whatever of ill health. But the quantity is nearly always small, or, if it be considerable, it is so only for short periods of time. Moreover, my own observations have shown me, that people who usually enjoy good health are temporarily indisposed when they have any but the smallest degree of indicanuria.

So far as indicanuria goes, it has therefore borne out the suspicion that these patients were suffering from absorption from the alimentary canal of abnormal products or bye-products of digestion. The importance of indicanuria as a sign of disease has been somewhat discredited of late, because it occurs so frequently in grave conditions and in trivial, and the pathognomonic value which it was at one time sought to attach to it was found to be erroneous. But I am of opinion that we may get much help in completing our diagnosis by discovering the presence of indican in the urine. For, so far as we know, the three conditions just mentioned are alone capable of leading to the formation of indol; and the two latter conditions, purulent exudates and albuminuria, are easily excluded in any particular case.

The question next arising is, whether indican, and its precursor indol, are in themselves toxic substances, or whether they are unproductive of harm, and merely accompany other bodies which are toxic, but the nature of which can at present only be surmised. It would be rash to attribute irritant and toxic properties to indol without some experimental proof of toxicity, but there is a certain amount of evidence—apart from physiological experiment—which goes to show that indol is noxious to the animal body. Thus it is admitted that indol is not a normal resultant of the digestion of proteid foodstuffs. The normal resultant of these is peptone, and indol (with its relative skatol) is generally accepted as being a decomposition product of peptone, the decomposition being effected by bacterial action. This latter is, no doubt, favoured by constipation, but is not limited by that state of the bowel, for we frequently encounter indicanuria in patients suffering from diarrhœa. Moreover, such actual observations as I have had the opportunity of making, show clearly that in periodic headaches and malaise, which are associated with indicanuria, the headache and malaise are accompanied by a larger quantity of indican, which disappears or diminishes as the state of normal health is restored.

I have attempted to separate, by fractional distillation, any volatile substance that might be peculiar to the urines of these patients. To this point my attention was directed by a remark by Mr. Coltart, who was at the time my house-physician, to the effect that, on the addition of hydrochloric acid, the urine frequently gave off a smell resembling that of carbon disulphide. There was undoubtedly a disagreeable odour, though there might be some question as to the comparison employed for the smell. But fractional distillation proved that this evil-smelling substance was present in perfectly healthy urines, free from indican, and the attempt in this direction therefore proved a failure. For the present there seems no means of furthering the inquiry as to the nature of this toxic substance, that is, whether it be indol or not, other than that of the physiological test.

Admitting this conjunction of facts, namely, gastro-intestinal disturbance, coupled with evidence of the absorption of abnormal products of digestion, and nervous disorders and diseases of different kinds, one is confronted with the question, "Is it probable that these diseases are caused by the presence in the blood of the abnormal digestive products?"

In considering the proximate causes of nervous diseases of insidious onset, syphilis and chronic alcoholism are generally placed at the head of the list as operating most frequently. Several of the mineral poisons likewise bear a prominent part in the etiology of this group of nervous maladies. It is also universally acknowledged that such conditions as phthisis, diabetes, and Bright's disease are capable of causing insanity of an intermittent character, by the temporary over-charging of the blood with chemical products resulting from the morbid process. The proximate causes of nervous diseases with a rapid onset are more frequently bacterial toxines, though some of the metals are likewise capable of producing acute symptoms. Symptoms in the latter class are probably due to direct poisoning of the nerve elements by the noxious material which for the time being is present in the blood. Possibly in some of the nerve diseases of slow onset and progressive course, and no tendency to cure, the pathology is similar, namely, the disease is produced by a deposit of the morbific material in the nerve elements; but in the majority of cases of this class, the permanent and progressive nerve degeneration is secondary to changes in the blood vessels and consequent malnutrition of the nerve elements—the vascular changes being generally of such nature as to render the transudation and absorption processes more slow and more difficult. In other words, we may say that several of the proximate causes of nerve disease with which we are acquainted can work in a double way, first by direct intoxication of the nerve elements, and next by a deleterious effect on the vessels which supply the nerve elements with blood. The best example of such an agent is alcohol in its acute and in its chronic effects.

In the light of these facts it appears reasonable to allow that, if a poisonous material be absorbed from the intestine, constantly or at frequent intervals over a long period of time, it would probably be capable of inducing first, nervous disorder, and then nervous disease, in the way I have just indicated, and which may best be likened to the well-known action of alcohol. Such evidence as I have given tends to show that an abnormal resultant of proteid decomposition is absorbed in these cases.

Moreover, for many individual cases of organic nervous disease we are unable to adduce causes, or, at least, we fail to do so if it is found that commonly recognised factors can be excluded. Refuge is then taken in such causes as wet and cold, physical shock, depressing circumstances, over-work, excessive sexual activity, injury, etc.

But it is very generally allowed that these last-mentioned agents are probably incapable by themselves of starting the morbid process, and that, in order to do so, they must act together with a diseased state of the blood. This blood state could, I believe, be usually found were it sought for, and might in many instances resemble that present in the cases I have here mentioned.

It is hardly possible to over-rate the importance of a complete diagnosis, I mean the correct and clear recognition of the exciting cause, in such cases. Even in marked organic diseases of the nervous axis, particularly in the chronic, there are, in addition to the symptoms and signs which are permanent, and certainly due to a definite destruction of nerve elements, a considerable number of signs and symptoms which are not due to complete, but to partial and progressing destruction and to temporary nutritional disturbance of the nerve elements. Let me instance such phenomena as the squint and the ptosis seen in locomotor ataxia, which disappear; the Argyll Robertson sign in the same disease, which—though more rarely than the squint—is also apt to disappear; the transient difficulties of retaining or of passing the urine; the temporary and momentary complete paralysis of the legs. Again, the sensory functions furnish us with equally striking evanescent symptoms, such as the fulminant pains in the limbs and the girdle pains in various parts of the trunk. All these phenomena, I repeat it, point to diseasing nervous elements rather than to elements already completely diseased. While they are diseasing, it is probable that, if we recognise the cause and can arrest it, the progress of the malady will stop, or proceed more slowly, so that reparative and compensatory efforts will be able to assert themselves; and then the nerve elements will be more readily brought under the influence of such specific nerve-affecting drugs as experience has shown to be useful.

Now the auto-intoxicative processes of which I have spoken, though not perfectly easy to control or arrest, are in some degree, at least, amenable to treatment. For this reason I think that there is a general hopefulness in nervous diseases so caused, always provided that the permanent changes have not proceeded too far; —and I would insist on the necessity of inquiring into the digestive processes as a possible cause in each case, with the same care that is usually given to syphilis in these inquiries.

The treatment of nervous affections, diagnosed as depending upon such auto-intoxications, will naturally turn in the first instance upon the removal of the cause. A sufficient course of aperients will generally be the proper measure to begin with; in these ailments I prefer the saline aperients to all others.

It may also be well to employ one or more of the drugs known to act as "intestinal antiseptics," seeing that the deleterious matter is certainly associated with bacterial action. I hesitate at the present time to recommend any one of these remedies unconditionally, and, for my own part, prefer to give several of them further trial before deciding whether they can be said to have a generally reliable action in restraining or arresting the microbial processes in question. Several intestinal antiseptics are distinctly useful in this direction, and, so far as my observation reaches, salol is the best. The diet of such patients may likewise, with advantage, be corrected. In several of my cases the general condition has been materially improved, and the indicanuria greatly diminished when a purely vegetable diet has been enforced; in no one case, however, has this measure caused indican to disappear completely from the urine. In connection with this point, I would draw attention to the long-recognised fact, that many epileptics suffer less severely from fits when on a vegetarian, than when enjoying a mixed, diet. In any case it will be as well to add to the diet such articles of food as tend to keep the bowels relaxed.

The maintenance of regular and copious action of the bowels is the main point in this part of the treatment. As in every nervous disease which has an exciting cause amenable to treatment, it is, however, not enough to remove the cause. The changed nerve elements must also be treated; and as a case of epilepsy, depending upon worms, is brought under the influence of bromides, and a case of locomotor ataxia, produced by syphilis, will require the use of arsenic, phosphorus, nitrate of silver, strychnine, etc., so these remedies must be employed in cases which we suspect to depend upon intestinal self-intoxication. By this combination of the two lines of treatment, the best opportunity will be afforded for compensatory action on the part of nerve tissues which have remained sound, and for recovory of those which have only commenced to degenerate.

In conclusion, it appears that a certain number of cases of nervous disorder and nervous organic disease are reasonably explicable by gastro-intestinal self-intoxication. What proportion of the cases which are not attributable to other causes may be explained in this way, can only be determined by much more extensive clinical observation. As regards indicanuria, and its importance as a sign of disordered digestion, it must be borne in mind, first, that it is a variable sign, apt to be present one day and absent the next, and that, therefore, value can attach to it when its presence is more or less constant; secondly, that it may well happen that there is much disorder of the digestive processes without the production of indol; and that consequently we must not allow the absence of indicanuria to exclude the possibility of disordered intestinal digestion.

The following is a list of the cases referred to. To avoid repetition of detail, the general appearances are not described in each instance. But in each one the facial signs and the condition of the tongue and breath, mentioned in this paper, were present with more or less completeness; the complaints made referred to the nervous symptoms and the digestive disturbances were readily admitted. The urine was in each case examined several times, and only cases showing repeatedly the presence of indican are included.

CASE 1. Annie J., æt. 30.—*Locomotor ataxia.*—Signs of moderate intensity. Under observation for many months. No syphilis. Constant indicanuria of a considerable degree. The course of the disease stopped under treatment.

CASE 2. Emily P., æt. 36.—*Locomotor ataxia.*—Signs of considerable intensity. No syphilis. Under observation three weeks. Constant indicanuria of considerable degree.

CASE 3. Edward M., æt. 51.—*Early locomotor ataxia.*—No syphilis. Two months' duration. Considerable indicanuria.

CASE 4. Thomas B., æt. 29.—Chronic alcoholism and *early general paralysis.*—Observed for two months. Constant considerable indicanuria. Indicanuria diminished under treatment.

CASE 5. Thomas C., æt. 28.—*Melancholic neurasthenia*, verging closely upon insanity.—Observed six weeks. Constant indicanuria. This latter diminished, other symptoms abated, but only a little, during the time he was under observation.

CASE 6. John B., æt. 38.—*Melancholia.*—Observed for several months. Constant indicanuria. Great improvement under purgatives and intestinal antiseptics.

CASE 7. Isaac S., æt. 39.—*Melancholia.*—Dating from an acute infective disease and growing progressively. Observed for a few days. Indicanuria marked.

CASE 8. Theresa C., æt. 23.—*Melancholia, with suicidal thoughts.*—Observed several weeks. Moderate but constant indicanuria.

CASE 9. Priscilla L., æt. 40.—*Sciatica.*—Observed four weeks. Marked indicanuria.

CASE 10. Sarah C., æt. 18.—*Epilepsy.*—Observed for months. Diagnosis difficult but finally arrived at as toxic, and this was confirmed by the further course of the case. Constant and intense indicanuria.

CASE 11. Winifred M., æt. 22.—*Epilepsy* since the age of 7.—Observed several weeks. Marked indicanuria. The latter diminished and the epilepsy became much easier under purgatives and salol.

CASE 12. Fred C., æt. 29.—*Epilepsy.*—Marked indicanuria for several months in spite of regular action of the bowels.

Case 13. Lily L., æt. 22.—*Epilepsy*, since the age of 7.—Much indicanuria.

Case 14. Kate W., æt. 30.—*Vertigo*, "*dazed feelings*," flushing and trembling.—No hysteria. Observed several months. Much indicanuria constantly in spite of regular action of the bowels. The symptoms much relieved and the indicanuria diminished under a vegetarian diet and the use of intestinal antiseptics.

Case 15. James D., æt. 39.—*Alcoholism.*—Complains of severe vertical pressure pain. Observed four weeks. Constant indican.

Case 16. Clara B., æt. 10.—*Night terror.*—Much indican.

Case 17. Louisa C., æt. 33.—*Headache.*—Depression. Much indican.

ON "WASHING" DYSENTERIC STOOLS.

By Kenneth MacLeod, M.D., LL.D., *Professor of Military Medicine, Army Medical School, Netley.*

The examination of the intestinal evacuation in dysentery has an importance, in relation to diagnosis and treatment, similar to the examination of the sputum in phthisis—similar, but greater; for in phthisis the results of physical examination are more clearly demonstrative of the nature and stage of the disease than inspection, palpation, and percussion of the abdomen in dysentery. These processes do, indeed, furnish useful information. The shrunken tender belly, the pain elicited by pressure along the course of the colon, the resistance, the perception of thickening of the whole or some portion of the large intestine, the detection of scybalous accumulations,—these are aids to diagnosis and localisation of lesion which cannot be neglected, and are perhaps more helpful in chronic than in acute cases.

Symptoms subjective and otherwise are also valuable; but the scrutiny by eye and microscope of the pathological products—the castings off from the diseased surface—afford more positive knowledge of the character and stage and curability of the disease than signs and symptoms. In some cases simple inspection of excreta is sufficient. The evacuations in acute cases, and in early stages of these, may consist simply of a tablespoonful or so of blood-stained mucus, with a few small clots, and rounded or oval scybalous matter surrounded by sanious fluid. The pathological product in such instances solely constitutes the stool, or lies apart from feculent matter so completely that it can be thoroughly seen and examined, or taken for microscopic or cultivation purposes without difficulty or obscuration by admixture with other intestinal contents. These cases are, however, a small minority, and are mostly those in which the disease is located not far from the anus,—rectal or low-down sigmoid. In the great majority of cases, more particularly in those of long standing, the pathological products are mixed up with feculence in such a way as to conceal them, and render necessary some means by which they may be separated. This may happen when the stools are liquid or solid. When diarrhœa coexists with dysentery, as often happens in the catarrhal stages of acute cases, and in chronic cases where there is defective absorption of fluid, and perhaps exudation from denuded or ulcerated surfaces, the feculent mass is gruelly or pultaceous, variously coloured—ochre, brown, umber, olive, or green—and probably gummy or glistening, but the mass seems to be uniform and its constituents are concealed. When the stool is solid, it may be lumpy and scybalous, or in rounded or flattened cylinders. These may be covered with clear or cloudy mucus; but in the interior of the masses, important things, such as casts and exuviæ of sorts, may be hidden from view. It becomes necessary, therefore, to disintegrate and dilute the mass, and if possible separate the pathological products from the feculent material. This can be done by adding water in considerable volume and successive quantities to the mass, decanting and observing after each addition of fluid, and finally retaining the residue for more careful examination. This process of "washing" dysenteric stools was first introduced into practice by Dr. Edward Goodeve, Professor of Medicine in the Calcutta Medical College. It is habitually employed in India; but recent books and papers published in this country on tropical diseases and on dysentery do not refer to the practice, and this constitutes a sufficient reason for setting forth here its method and advantages in detail.

Technique of the process.—The stool is received in or transferred to a vessel of considerable capacity—the pan of a commode, for example. This is filled with water poured from a height of a foot or so, from a jug or ewer or tap. Masses may, if necessary, be broken up by a glass rod or stick. After allowing the material to settle for a minute or so, the fluid is slowly decanted into another vessel, so as to present to view a thin layer. The feculence floats and passes over with the fluid; the pathological products and heavy particles of feculence subside. What passes out is carefully watched and noted, and what remains may be again and again washed by adding fresh volumes of water and decanting, until the material has been freed of offensive and compromising stuff, when it may be transferred into a white plate or dish for examination. The process may be employed in other intestinal diseases, sprue for example. In most cases of dysentery, accurate study of the intestinal discharges cannot be made in any other manner.

The information gained by this process of washing the stools may be summarised as follows:—

1. The colour of the fluid indicates the amount of blood con-

tained in the evacuations, according to the depth of the tint when it is sanious.

2. The size, shape, and character of feculent masses when solid may be noticed, and inferences may be drawn as to the condition, calibre, and tone or irritability of the diseased gut.

3. The nature and activity of the digestive process may be inferred from the state of the excreta. Undigested masses of meat or farina may be seen, or curdy lumps of imperfectly digested milk observed.

4. The character of the ingesta may be determined. Imperfectly masticated and undigested pieces of potato, vegetables, or fruits are easily identified, and grains of unboiled rice or sago discerned, and seeds of oranges, figs, grapes, etc., descried. Many of these things sink and are seen amongst the residuum. The dieting of the patient can thus be very effectually watched and controlled.

5. The lighter particles of mucus float in the water, and this may be flocculent or tenacious—clear, rosy, branny, or ropy. Inferences are drawn from these characters, as regards the stage and intensity of the dysenteric process and effects of treatment. Clear or rose-coloured flecks indicate an early (catarrhal) stage; branny particles, a dysentery undergoing satisfactory cure; and ropy masses, a slower process of recovery in a more protracted case.

6. The residuum may show blood clots of various kinds and sizes, masses of jelly-like mucus, lumps of more solid inspissated mucus, and casts or exuviæ of various sorts. These latter are the most important pathological products, indicating a grave malady of some standing, and destructive lesions of varying kind and degree. The nature of the destructive process may be surmised from the character of these casts or sloughs. They may be pulpy and circular, or oval, soft, and disruptible, yellowish or greenish, consisting of a pus-infiltrated mucosa, and representing castings off of an inflamed mucosa or submucosa. They may be stringy, tenacious, and angular, consisting mostly or entirely of detached submucosa. They may be greenish or drab-coloured, thick, large, or cylindrical, the result of coagulation necrosis of an extensive diphtheritic deposit on and in the walls of the intestine. They may be dark, pulpy, offensive, and soft, due to a process of gangrene. The relation of these different products to diagnosis, prognosis, and treatment is obvious and most important.

7. The products thus obtained can be subjected to further examination, for bacteria or amœbæ for example, or preserved with spirit or carbolic water for further study.

8. The results of treatment may to some extent be judged. Changes in the character of the evacuations are best appreciated when these are subjected to this system of analysis. Pills or tabloids may be seen which have passed through unaltered and

unused. Grains of ipecacuanha or other powders, or of reduced bismuth, may be observed, which perhaps increase or perpetuate the irritation.

The intelligent treatment of dysentery necessitates continuous and systematic examination of the stools, and the method which I have described largely robs this proceeding of its unpleasantness, while it contributes most materially to thoroughness and enlightenment.

A CASE OF MURDER AND SUICIDE.[1]

By HARVEY LITTLEJOHN, M.B., F.R.C.S.Ed., *Lecturer on Medical Jurisprudence, Surgeons' Hall, Edinburgh.*

WHEN two bodies are found in the same room with fatal injuries upon them, several questions of medico-legal interest and importance arise. Among these, one of the first requiring an answer is, whether we have to deal with death from accident, suicide, or murder, or a combination of two of these conditions.

The accidental death of two persons together, as a result of external violence, is as a rule recognised without difficulty, from the surroundings and nature of the injuries, the cause of death being usually obvious, and all the circumstances pointing to a sudden and unexpected calamity.

The question of murder or suicide is not always so easily determined, and a decision upon this point can in most instances only be arrived at after careful consideration of the whole circumstances and an examination of the injuries.

By the circumstances are meant chiefly those connected with the position and surroundings of the bodies, and it is of the highest importance that the medical man who is required to give an opinion in such cases should have the opportunity of making his examination of the bodies and the immediate surroundings before they are in any way interfered with.

The position of a body may be wholly inconsistent with a theory of suicide, or, on the other hand, it may afford strong presumptive evidence of it; and in the same way the position of any weapon found, or of marks of blood on furniture or in the room, may afford circumstantial evidence of the strongest character, leading to the discovery of an unsuspected crime. It is obvious that where a decision on so vital a point as the determination of the question of murder or suicide may rest largely, in certain cases, upon such circumstances as the position and surroundings of a body; and, more especially in cases where two bodies are involved, no interference with them should take place until an examination has been made by a competent authority.

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[1] Read before the Edinburgh Medico-Chirurgical Society, 17th January 1900.

Many points which to the police officer appear to have no significance may be of the greatest importance and assistance to the medical examiner in arriving at a correct interpretation of the case.

When once the position of a body or weapon has been altered, the difficulty of exactly reproducing in every detail the original arrangement is well known, even when careful observations have been taken, but naturally it becomes well nigh an impossibility when the interference has been carried out hastily and by ignorant persons.

The following case, which occurred some time ago, and which I had an opportunity of observing, illustrates the above points, and also some other questions of medico-legal interest. One morning a gentleman arrived at an hotel and engaged a room for himself and his wife, who he stated was to join him later in the day. His appearance and manner attracted no particular attention, and he employed himself during the afternoon in writing letters in his room. In the evening he went out, and returned to the hotel accompanied by a lady, with whom, after having some refreshment, he retired for the night. Next morning, at breakfast, they both appeared to be perfectly happy, and on good terms. They went out apparently to do some shopping, and returned to the hotel about one o'clock, and immediately proceeded to their bedroom. Nothing peculiar was noticed about either of them, except that the man was muttering to himself, and that he slammed the door of the bedroom behind him.

Nothing more was seen or heard of the couple, although, their luggage having been packed, it was presumed that they intended to leave that afternoon, until seven o'clock in the evening, when an entrance was forced into the room, and they were found lying dead upon the bed in a pool of blood.

Both were fully dressed, just as they had been when out walking, with the exception of their hats. The room was in no way disordered, and there were no marks of blood anywhere except upon the bed. The body of the woman lay on its back across the bed, her legs hanging over the edge so that the feet almost touched the ground. It was warm, but rigidity of the neck and arms had already set in. Her face, which was turned towards her right shoulder, was covered with blood. The right arm was semiflexed, and extended from her side, so that it lay on a level with her head. The hand was covered with a tightly fitting strong dogskin glove, which showed no trace of any cuts or marks of blood. The left hand, which was also gloved, lay by her side under the body of the man, which extended transversely across her. Her dress showed no disarrangement.

In the neck on the left side there was a wound, with clean regular edges, 4½ in. long and extending from half an inch below the symphysis menti downwards and backwards to a point about 2 in. below the angle of the lower jaw. All the structures were divided down to the large vessels upon the left side—the internal jugular vein being completely cut through, while the common carotid artery was laid bare but was uninjured. The thyroid cartilage was completely divided just above the true vocal cords, and the incision passed backwards through the posterior pharyngeal wall to the vertebral column, which was deeply scored. The large vessels upon the right side were exposed, but were uninjured. There was no evidence of any second attempt at dividing these structures, all were cleanly cut through by a single gash, even the thyroid cartilage, exhibiting a perfectly regular and even line of division. The injuries to the structures on the right side of the neck, and the complete division of the larynx, are peculiar, in view of the fact that the wound in the skin did not extend beyond the middle line of the neck, but I account for the nature of the injuries by the face having been forcibly turned towards the right shoulder, and to the force having been directed obliquely backwards from the right to the left side of the neck; the wound was thus much deeper towards the right side than on the left, where it tailed off in the superficial subcutaneous tissues.

The deceased had on a jacket with a high collar, and the upper margin of this collar had been cut through on the left side opposite the wound in the neck.

A point of interest and importance was the presence of two superficial wounds in the skin of the face, one on the left side of the nose and the other in the middle of the forehead. Both presented the appearance of having been inflicted by a very sharp knife, and were merely superficial, running obliquely into the skin from left to right, and evidently of quite recent origin. There was no blood on the front of her dress or upon her hands and arms, but there was a considerable quantity on her face and on either side of the neck, down which it had flowed and deeply stained the bedclothes immediately beneath those parts.

The man lay extended upon his face across the body of the woman, his head resting upon the pillow and his feet at the foot of the bed. Both arms were extended from the side of the body in a semiflexed position; and close to his right hand, which was covered with blood, there was an open razor, likewise covered with blood. His throat was cut from "ear to ear," the thyroid cartilage being completely divided just below its upper border, and, from another deep gash in it a little lower down, it was evident that more than one attempt had been made to divide it. All the structures down to the deep vessels on either side were divided, but only the internal jugular vein upon the left side, among the large vessels of the neck, was injured. The pharynx was not opened into. At the commencement of the incision in the skin upon the left side, there were several of those superficial cuts so frequently seen in cases of suicide, while in the woman this appearance was absent.

The front of his body was drenched with blood. The blood marks on the bed, however, were confined to those portions of the bed immediately under the bodies, the rest of the white bedcover being absolutely spotless. This is interesting, and corresponds with what we should expect from the nature of the injuries found, namely, in both cases wounds of the jugular veins but not of the larger arterial trunks, while it also indicated that neither of the two deceased persons moved from the bed after the infliction of the injuries.

In the pockets of the man's coat there were found some rings belonging to the woman, two razors, and two letters foreshadowing the death of both, but indicating that it was to take place by common consent. These were probably the letters which he was seen to be writing the previous day, as they bore that date.

From the foregoing account it is evident that we have to deal with injuries produced either homicidally or suicidally. There are three possibilities which have to be considered—(1) That both were murdered, (2) that both committed suicide, or (3) that one murdered the other and then committed suicide.

Against the first of these suppositions many points may be urged, and there is little difficulty in disposing of it. The fact that the door of the bedroom was locked upon the inside, and that there was no access by means of the window; further, the fact of no cries being heard, or of any signs of a struggle being present in the room, or on the persons of the deceased, such as one would expect in a homicidal attack upon two active adults, all strongly negative the possibility of a double murder. The character of the wound of the throat in the man's case, but more especially the localised distribution of blood in the room, namely, its being confined to the bed, and to those parts of it immediately underneath the bodies, do not favour such a possibility. In regard to the second supposition—that of double suicide—it is well known that two people, or even a larger number, sometimes decide to end their lives together by their own hands, and this possibility is all the more probable when we have to deal with two persons of different sex. Domestic difficulties and afflictions, or a hopeless attachment, are sufficient inducements for some people to end their existence; and the possibility of such circumstances having existed in the present instance must not be lost sight of. On the other hand, it is very rare that such a double suicide has been effected by cut throat. Women, and more especially women of some refinement, as in the present case, do not care for methods of self-destruction which entail severe injury and disfigurement of the person; their inclinations tend rather to such means as drowning, hanging, or poison, by which methods death is known to be comparatively painless, and yet be equally certain to result.

From the mode of death, therefore, in this instance, the probability is against the suicide of the woman; while her whole bearing, as observed by several witnesses, and the fact of there being no indication of such an intention, as was the case with her companion, as his letters testify, render this probability yet stronger.

In addition to these considerations, the character of the wound upon the neck, its position, its direction from above downwards and backwards, and from right to left, together with the fact of her hands being enclosed in tight, strong leather gloves, which must have interfered with the power of the hand to inflict such a severe wound, the absence of blood on the gloves and down the front of her dress, entirely exclude, in my opinion, the theory of suicide on her part.

There remains therefore for consideration only the third proposition, namely, that the case was one of murder and suicide. From what has already been stated, and looking to the fact that we have to deal with a strongly built man and a comparatively weak woman, practically the only possibility is that the man was the murderer, and afterwards committed suicide. This view is borne out by all the circumstances.

The woman, as previously stated, was fully dressed, even to her outdoor jacket and gloves, and the former had actually been cut through in the production of the wound in the neck. This circumstance alone is of great significance, since a suicide by cut throat always takes care that nothing intervenes to prevent the easy accomplishment of the deed. The wound itself, commencing below the chin, and running from above downwards and backwards on the left side of the neck, is a wound which might be self-inflicted by an ambidextrous or left-handed person, but is wholly inconsistent with self-infliction by a right-handed individual.

At the same time, I may remark that a very considerable experience in cases of cut throat has brought very forcibly before me the fact, that the descriptions given in many books on medical jurisprudence of the distinctive characters of suicidal and homicidal cut throat wounds, as regards their situation and direction, must be accepted with caution, inasmuch as a suicidal wound may be situated practically anywhere in the neck, and present the appearance usually stated to be characteristic of a homicidal wound.

The depth and extent of a wound in the throat afford little help in making the distinction, since a suicide is able, not only to divide the larynx and soft parts as far back as the vertebral column, but, as in one instance which came under my observation, he may cut into an intervertebral disc, and even penetrate to the vertebral canal.

In the present instance of the woman, however, it is the direction of the wound in a right-handed person rather than the depth or severity, which in my opinion excludes suicide so far as the injuries are concerned. In a homicidal attack with a knife, one would certainly expect the victim to exhibit some signs of resistance, more especially upon the hands, where cuts from attempts to grasp the knife are very characteristic. Such injuries are wanting in the present instance, with the exception of the two small cuts upon the nose and forehead, which were probably produced by some slight struggling and movement of the head; and in all probability the absence of other signs of a struggle is to be accounted for by the attack having been made suddenly, while the victim was lying upon her back, and without any warning of her assailant's murderous intention.

As strongly as the evidence in the case of the woman points to homicide, so does that in the case of the man indicate suicide. The position, direction, and extent of the wound in the throat, the razor found on the bed near his right hand, the blood upon his right arm and hand and on his clothes anteriorly, all indicate suicide; while the respective position of the bodies points to the deed, in the man's case, having been executed subsequent to the infliction of the injuries to the woman.

If one may attempt to picture the course of events, I believe that what occurred in all probability was the following:—When they returned from their walk, and shortly after they entered the bedroom, the woman was sitting on the edge of the bed. The man, probably quite playfully, pushed her backwards, and, kneeling over her, suddenly took a razor from his pocket, and attacked her before she realised his murderous intention and could offer any resistance. From the localised distribution of the blood marks, she evidently was unable to make any further movement, and he must also, without moving from the bed, there and then have cut his own throat, and fallen across her body in the position described.

The state of mind of the man, who harboured such an awful design for some time prior even to the arrival of his paramour in Edinburgh, as evidenced by his letters, and who yet was able to dissimulate so perfectly as to spend an apparently happy time with her, and engage in the purchase of articles for their wedding, a few hours prior to the committal of the act, offers ground for interesting psychological study. I would merely draw attention to the fact that such behaviour is not inconsistent, in people who have shown no previous signs of mental aberration, with a preconceived and fixed design of murder, a design carried out in the present case with unrelenting and unswerving resolution, against a person towards whom his professions and previous behaviour indicated a true, if not very deep, affection. The man's manner, prior to the deed, gave no indication of the terrible scheme he harboured and foreshadowed in the letters written on the previous day, and this circumstance must be held to dispose of any theory of sudden homicidal impulse, and subsequent suicide from grief at his act. There does not appear to have been any motive for the crime; there is no suggestion of unrequited love in their relationship, or of jealousy or infidelity; while to neither can be laid the charge of intemperance, one of the most common causes of crimes of this nature.

In fact, there does not seem to have been any other motive than simply that his circumstances in life did not enable him to fulfil his promise of marriage at the time he had fixed, and he therefore determined to end his life, and at the same time compel his betrothed to share his fate.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

The Principles of Treatment and their Applications in Practical Medicine. By J. MITCHELL BRUCE, M.A., M.D., F.R.C.P. Edinburgh and London: Young J. Pentland. 1899.

THIS handsome volume is to some extent an amplification of the section dealing with "General Therapeutics," in the author's well-known work on "Materia Medica," but the subject-matter is here treated with so much more detail, and from so much wider a standpoint, that it really constitutes a new departure in therapeutical literature. In plan and scope it differs also very materially from the ordinary text-books on therapeutics, and it may therefore be regarded as the outcome of Dr. Mitchell Bruce's personal experience as a medical practitioner and teacher. Substantially it is a carefully thought-out examination of general principles, as opposed to empirical measures, in the treatment of disease. As the author himself says, "Simple authority is still very largely the ordinary guide in medical practice"; and he lays down his own method in the preface in these words: "The course that the author has long followed, both in the class-room and at the bedside, is to direct the attention of students, first and chiefly, to the objects of treatment, which their study and observation of pathological and clinical facts reveal to them; and thereafter, and not till then, to discuss the selection of medicinal and non-medicinal measures calculated to effect the desired ends." Further on he says: "The student will be led from the individual facts of disease to obvious therapeutical indications; and we shall bring to bear upon the problems of hygiene and therapeutics all the knowledge of medicine and the medical sciences that we have acquired by our work, reading, and reflexion. . . . We shall thus be in a position to formulate the principles of treatment on rational lines, and to give other reasons for our practice than authority, expediency, or even experience." In pursuance of this plan, the book is divided into two chief parts, the first being entitled "Principles of Treatment," and the second "Illustrations of the Principles of Treatment." The former is again subdivided under three headings, which comprise respectively the therapeutical lessons to be learnt from a consideration of the etiology, pathology, and clinical characters of disease, which three factors are assumed to be the most important in giving indications for the intelligent application of remedial measures. Under etiology, Dr. Bruce considers at some length the part played by microbes, parasites, traumata, and food; under pathology, the rôle of inflammatory processes and their various consequences; while the clinical indications include such symptoms as pain, disturbance of function, and the form and methods of their natural relief. Then follows an interesting chapter on the therapeutical bearing of the individual factor, sex, age, and disposition. In discussing the "Means of Treatment" at our disposal, drugs, nursing, and such measures are passed over in a few sentences, while lengthy consideration is given to food, exercise, rest, and nervous influence. The second half of the volume consists of twenty-three chapters, each of which is devoted to the consideration of the measures to be adopted in treating one of the more commonly occurring diseases, such as endocarditis, bronchitis, asthma, acute pneumonia, phthisis, appendicitis, cerebral hæmorrhage, typhoid fever, etc. In each, the indications for treatment are systematically taken up under the headings etiological, pathological, and clinical, and the principles enunciated in the first portion of the book are worked out to their logical conclusion and practical application. At the end of each is a summary entitled "Outline of Practice," giving prescriptions and short detailed directions for treatment, these constituting a very practical and valuable addition to the work.

Such, in short outline, are the contents of this very interesting volume. Scattered throughout the text are many valuable observations and much good therapeutical advice, often in very small compass and epigrammatically expressed. For instance, "The simple naming or labelling of a disease is regarded as practically equivalent to a knowledge of the whole nature of the case"; and, "He cannot too clearly realise that a large measure of the success which attends practice is due to the fact that, in many instances, it is not grave pathological conditions, known as valvular disease, Bright's disease, and the like, that call for treatment, but a series of minor disturbances of a functional character which have supervened upon them, and which are quite remediable." It is certain that Dr. Mitchell Bruce's work will be a favourite with many medical readers, especially those who have a craving for system and logical method, while others may be inclined to complain of a want of terseness and coming to the point in its style, and a didactic tendency to take great pains to point out the obvious. It is hardly necessary to express in so many words the fact that "vacillation is one of the worst of weaknesses in a practitioner"; or that "flight is one of the most useful provisions possessed by animals and man for preserving life and health, that is, for escaping death, injury, and disease"; or that, "if the case be doing well on the treatment employed, the indication is to continue this until fresh indications arise." The somewhat metaphysical character of the work in certain parts is shown by three pages being devoted to what is called "The Justification of Treatment," a practical point already settled by mankind in a common-sense way at a time so remote that physicians and philosophers were not. The chapter on what is called the "Art of Treatment" is in curious contradiction to other parts of the book. The author's point of view, and even his meaning, in the following sentences are very difficult to understand:—"Theory is but an imperfect guide now; art is everything—to seize on the essential and useful at the right moment. Hard-and-fast routine is felt to be useless, even by the most casual practitioner; the immense value of general principles, rather than of specific authority or direction, is fully appreciated."

RALPH STOCKMAN.

Ovariotomy and Abdominal Surgery. By HARRISON CRIPPS, F.R.C.S. London: J. and A. Churchill. 1898.

IN the preparation of this book Mr. Harrison Cripps has had the assistance of several of his colleagues, by whom special sections have been written, such as that on the anatomy of the abdomen by Mr. Waring, that on the surgery of the kidneys by Mr. Bruce Clarke, and that on the radical cure of hernia by Mr. Lockwood. The book is not intended to be a complete text-book, but rather to be an account of the views held and the treatment adopted by the authors of the various sections. This being the case, it seems to be unnecessary to devote thirty-six pages to a description of the anatomy of the abdomen, which description cannot, of course, be so full and complete as that in the ordinary anatomical text-books. At the same time we must say that Mr. Waring's account is a good one, though we notice that on p. 13 the pylorus is described as being immediately to the left of the middle line. Some thirty pages are devoted to the description of the preparation of the patient for operation, and to an account of one of the operating theatres at St. Bartholomew's Hospital. As regards the former, the directions given are full and precise, though we think it hardly necessary to wash the patient all over with the 1 in 20 carbolic lotion, while we certainly think it would have been well to mention the necessity for shaving the pubes. The diagnosis of ovarian tumours is well described, as also is the operation of ovariotomy. The suggestion that, after the removal of a broad ligament cyst, the edges of the capsule should be stitched to the borders of the abdominal wound, is attributed to Mr. Alban Doran, though it is our impression that this is and has been for a long time the usual line of practice. With this practice Mr. Cripps does not agree, and seems rather to scoff at the idea that, if the capsule be dropped back, a hæmatoma will be likely to form. We are glad to see that for closure of the parietal wound Mr. Cripps has abandoned the use of buried sutures. The use of these is, in our opinion, unnecessary, and is conducive to troublesome suppuration, whatever precautions are observed.

For the relief of obstinate distension after abdominal section, Mr. Cripps advises the performance of enterotomy, and gives good reasons for his advice. We ourselves have not as yet carried out this practice, but opinion seems to be gradually coming round to the fact that, when an abdomen is opened for acute general peritonitis, the distended intestine should be emptied by incision into it. This is, after all, no new practice, for it was carried out by the late Mr. Lawson Tait a good many years ago. The chapter on peritonitis needs revision. To start with, the author, speaking of acute septic peritonitis, says: "If it originates in the rupture of a cyst or abscess with aseptic contents, the onset will be sudden." It is news to us that septic peritonitis can be set up by rupture of a cyst with aseptic contents. Again, while on a former page trouble is taken to show that distension of the abdomen in peritonitis is due to paralysis of the intestines, on p. 213 it is stated that "the acute pain in peritonitis seems to be the griping caused by irregular peristaltic contraction."

Two of the best chapters in the book are those on intestinal obstruction and inguinal colotomy, two subjects upon which Mr. Cripps is entitled to speak as an authority. The sections on the surgery of the kidney by Mr. Bruce Clarke and on radical cure of hernia by Mr. Lockwood give excellent accounts of the practice followed by those surgeons. The latter chapter would have been improved, had a little more care been taken as regards composition and punctuation.

Taking the book as a whole, we consider it to be valuable as giving an account of the practice of surgeons skilled in the subjects upon which they write; but we cannot say that the book contains anything strikingly original, or that it advances our knowledge of the subject to any great extent. CHRISTOPHER MARTIN.

A Manual of Surgical Treatment. By W. WATSON CHEYNE, M.B., F.R.C.S., F.R.S. and F. F. BURGHARD, M.D., M.S. (Lond.), F.R.C.S. Part II. London: Longmans, Green & Co. 1899.

THIS second instalment of Messrs. Watson Cheyne and Burghard's great work will be very welcome to those who have read vol. i., the more so as, good as was part i., we think this part is even better. The contents of part ii. are the treatment of deformities and surgical affections of the tissues, including the skin and the subcutaneous tissues, the nails, the lymphatic vessels and glands, the fasciæ, bursæ, muscles, tendons and tendon sheaths, nerves, veins, and arteries.

The first 140 pages are occupied in giving a clear and, on the whole, very satisfactory account of deformities, the subject of scoliosis being omitted in order to be included in part v. along with the other affections of the spine. In the section dealing with hammer-toe we are glad to see that removal of the head of the first phalanx is strongly advised in all but the very slightest cases, and that amputation is condemned as a method of treatment. The authors point out that, if only enough bone be removed, the toe can be straightened without the least tension, and that there is no necessity to divide any ligaments or tendons.

In the treatment of flat-foot, Whitman's spring, made of aluminium, is strongly recommended; and we think that those surgeons who have made use of this apparatus will agree that its results are most satisfactory.

There are comparatively few mistakes in this carefully written work, but we fear that the student, who in the anatomy class has learned that by abduction of the toes is meant movement away from a line drawn through the middle of the second toe, will be somewhat confused when he reads that in hallux valgus there is abduction of the great toe.

The important subject of club-foot is exhaustively treated. Congenital talipes is held to be probably due in the main to some arrest of development in the fœtus, more particularly to some cause which leads to failure of the rotation of the foot from its fœtal into its post-natal condition. Due importance is rightly attached to the fact that, in the treatment of club-foot, the patient must not be regarded as cured as soon as the foot has been got into its proper position, but that treatment should be continued for a long time, even after apparent recovery. Several years should be devoted to it.

Division ii. of this volume concerns itself with the surgical affections of the tissues, the skin, subcutaneous tissue, the nails, lymphatic vessels, lymphatic glands, fasciæ, bursæ, muscles, tendon sheaths, tendons, nerves, veins, and arteries. On the whole, it may be said that these sections are excellent, and that they contain little to which exception can be taken. In the treatment of carbuncles of *moderate* size, it is recommended to make an incision completely encircling them, and to dissect them out clearly. In very extensive carbuncles, the treatment advised is incision and scraping, followed by the impregnation of the raw surface with undiluted carbolic acid.

In the treatment of varicose veins of the lower extremity, particularly where the varicosity extends with the thigh, we are glad to note that the authors insist upon the advisability of performing Trendelenburg's operation. "Under such circumstances (they say) the important point is first to block the internal saphena close to its junction with the femoral vein." After operation for varicose veins, we are told that, when the patient gets up, it is well to apply a bandage from the foot upwards, to support the veins. This rather reminds one of the advice to wear a truss after a *radical* cure of hernia, and is surely superfluous, provided that the operation has been thoroughly performed, and the patient has been kept for a sufficiently long period recumbent.

In the treatment of aneurysm, Macewen's method, of the insertion of fine steel needles through the wall of the sac, so as to scratch the wall on the opposite side over a considerable area, scarcely meets with due appreciation, as we find it stated that "failing any of these (*i.e.* all other methods of treatment), we can only fall back upon galvano-puncture, or the use of Macewen's needles." We feel convinced that any surgeon who has given Professor Macewen's needles a fair trial will have a far higher opinion of their value than the authors of this work seem to entertain.

Whilst we have little fault to find with the text, and much to commend, we cannot refrain from expressing our regret that the illustrations are in every way unworthy of it.

HERBERT F. WATERHOUSE.

Clinical Medicine: a Manual for the Use of Students and Junior Practitioners. By JUDSON S. BURY, M.D. Second Edition. London: Charles Griffin & Co., Limited. 1899.

THE appreciation with which Dr. Bury's "Clinical Medicine" has been received by those for whom it is intended, is shown by the fact that a second edition has been called for within a few years of the appearance of the first. The book is in many ways a most useful one for the student during the time when he is occupied in clinical work, either in the wards or out-patient department. It is brought well up to date in the present edition, and many additions and alterations have been made. Among these, we notice a chapter by Dr. Dixon Mann on the examination of the deeper structures by means of the Röntgen rays, an amplified and revised chapter on examination of the skin and its appendages, and numerous additions in the chapter on the urine. One of the most useful features of the book is the large number of illustrations which are scattered through its pages. Many of these are taken from cases under the care of the author or his colleagues, and most of these show excellently the external characters of the disease they are intended to illustrate. Where there are so many good pictures, it seems almost invidious to mention the few that are not. It should not be difficult, however, to obtain more typical pictures of myxœdema and acromegaly than those which are given. The cut which is said to illustrate a case of symmetrical gangrene (fig. 78) appears to us a complete puzzle.

The usefulness of the book as a work of reference would have been greatly increased had the index been made somewhat fuller. For instance, both the Widal reaction and Babinski's sign are considered in the text, but the only reference to Widal in the index is under the heading, "Blood Serum Diagnosis of Typhoid Fever," while there is no reference either to Babinski or plantar reflex. The index in this work runs to twelve pages with double columns, which may be thought sufficient, but the index in other works of similar size extends to nearly twice that length.

With regard to the descriptions given of the bacteriological, chemical, and microscopical examinations required in the investigation of disease, the book does not pretend to give as full and detailed an account as contained in such a work as that of v. Jaksch, from which we notice many of the illustrations in this part of the volume are taken. Still, the chapters on the blood and the urine are very good, and we do not think that the author's opinion, that the part dealing with the chemical examination of the urine, as here revised by Dr. Dixon Mann, is one of the most useful and accurate in the English language, is in any way an exaggerated view.

The chapter on the examination of the fæces is, however, unduly short. No account is given of the *Amœba coli*, which is of so much importance in relation to amœbic dysentery and hepatic abscess. The description of worms is very meagre, and more space might have been given to an account of their ova and the means of recognising them in the fæces. The remark that *Trichocephalus dispar* is stated to occur in great numbers in beriberi, seems irrelevant, and might suggest to the student that there is some relation between the worm and this disease, which, as far as we know, is not the case.

The chapter on examination of the surface of the body is a thoroughly practical one. There is too much tendency for students nowadays to neglect that most useful part of every examination, the inspection, and thus overlook much that may be learnt which will assist them in their further investigation of the case. One sees at examinations how impatient they are to put the stethoscope on the patient's chest, as if the use of this instrument was the only method of investigation with which they were acquainted.

What strikes us as the least satisfactory chapter is that dealing with the examination of the respiratory system. The subject of physical signs, in their relation to the respiratory organs, is admittedly one of great difficulty, and Dr. Bury has perhaps only reproduced to some extent the confused ideas of those who have written on the same subject before him. His account, however, of the physical signs falls far short of that given by Dr. Paul Guttmann, in his text-book published a quarter of a century ago. It is an unfortunate thing for the student that a looseness of expression pervades most writings on the subject. To use the term "tone" first as the equivalent of musical sound, and then as synonymous with quality or timbre, and to finish by quoting some remarks of Dr. Gee, to the effect that "the words tone and resonance, as applied to percussion sounds, mean the same thing" is calculated to leave the reader's mind in a hopeless state of confusion. It is, we consider, a misuse of terms to speak of râles as small or large or of uniform size, although such terminology has been employed by many writers before Dr. Bury.

The chapters on the circulatory system and on the digestive system are both good. We are glad to see that Dr. Bury impresses the student with the great importance of palpation in examining the abdomen, but we do not agree that this is carried out most efficiently when the patient's knees are drawn up. We have satisfied ourselves that Glénard is correct in teaching that the better position is with the legs extended. We should, we may add, be inclined to attach more importance than Dr. Bury does to bimanual examination.

The chapter on diseases of the nervous system appears to us one of the best in the volume. It ought to prove extremely helpful to the student in his investigations of this difficult class of case. The table showing the relation of motor and sensory functions to spinal roots is a very useful one, while numerous diagrams are given, which serve further to illustrate the functions of various parts and their relations to one another.

Altogether, the book is one of the best of its kind. If we have not said *nil nisi bonum* regarding it, it is because we see every sign of vitality in it, and look forward at no long interval to the appearance of a third edition with still further improvements.

HECTOR MACKENZIE.

A Manual of Surgery for Students and Practitioners. By WILLIAM ROSE, M.B., B.S. (Lond.), F.R.C.S. and ALBERT CARLESS, M.S. (Lond.), F.R.C.S. Second Edition. London: Baillière, Tindall, & Cox. 1899.

IT is only a few months since the first edition of this manual was favourably reviewed in these pages, and we may congratulate the authors on the early call which has been made for a second edition.

The reason for the popularity of such a work is not far to seek. The text has been carefully written; it is a faithful presentation of the most modern views on the theory and practice of surgery; and, above all, is within reasonable compass. The present edition differs so little from its predecessor that it is not necessary for us again to deal with the work at any length. We note with satisfaction that a number of the suggestions thrown out on a former occasion have been adopted, and that in other directions the work has been improved.

We cannot refrain, however, from referring to the confusion which arises from the distinction the authors seek to draw between "sepsis" and "infection," and from the indefinite use they make of such terms as "simple inflammatory," "infective," "specific," and "idiopathic," in the classification and description of such diseases as ulcers, gangrene, diseases of the bones, etc.

We fear the junior student will be sadly mixed in his ideas of the relations of septic organisms and processes to one another, and of both to the general economy of the patient, after reading the first six pages of chapter v. Then, what are we to understand by "simple inflammatory ulcers"? Are not all ulcers inflammatory? And why should a "spreading," a "sloughing," a "phagedenic," or a "callous" ulcer be characterised as "simple"?

And, further, we are at a loss to know why the phagedenic ulcer is classified with those that are simple, while the phagedenic variety of gangrene is an infective or specific condition. And it is surely a perversion of the meaning of words to speak of senile, embolic, or diabetic gangrene as "idiopathic."

The chapters on regional surgery are all of a high standard of excellence; but we are not convinced of the advantage of discussing the injuries of different regions apart from their diseases.

The illustrations in the present edition have been considerably improved in various directions, although we must say that the new blocks illustrating microscopical appearances are not always of great educational value. We cordially wish this manual the continued success it deserves.

ALEXANDER MILES.

The Soluble Ferments and Fermentation. By J. REYNOLDS GREEN, Sc.D., F.R.S. Cambridge: The University Press. 1899.

IN this volume on fermentation the series of Biological Manuals receives a most valuable and welcome addition. The treatment of this subject in text-books of physiology and biology has always been very unsatisfactory, and has never kept pace with the more recent advances in our knowledge. This has no doubt been in part due to the fact that no really satisfactory text-book on the subject has up to the present existed in the English language.

The author has endeavoured "to put together, as far as possible, the results reached up to the present time, and to put forward a view of our present position with regard to the whole subject." The importance of the relation existing between fermentation and the general metabolic phenomena of living beings is rightly laid great stress upon; but he appears to go beyond what the facts at present would warrant, when he affirms that the distinction drawn between organised and unorganised ferments is based upon an incomplete acquaintance with the metabolic processes, and must be abandoned in the light of fuller knowledge. This view seems to be based chiefly upon the recent discovery by Büchner of *zymase*, an extract obtained from yeast cells, which was able to set up the alcoholic fermentation in sugar. The assumption, however, that in the other fermentations such active extracts may in the future be separated, does not at the present time seem warranted, and even the view that the alcoholic fermentation is carried on in the living yeast cell by means of an enzyme is still open to criticism. The different chapters in this book give a very full and exhaustive account of the animal and vegetable enzymes which have as yet been described; but the chapters devoted to the organised ferments, although very useful, may not be found quite so satisfactory to the bacteriologist who has devoted special attention to this subject. This book must, however, be regarded as by far the most complete and satisfactory manual on fermentation which has yet appeared in our language, and the author is to be congratulated on having so successfully treated one of the most recondite branches of biological science. G. E. CARTWRIGHT WOOD.

Les Sucres et leurs principaux dérivés. By L. MAQUENNE. Paris: Georges Carré et C. Naud. 1900.

THERE is no more interesting subject in the vast field of organic chemistry than that dealing with the carbohydrates, and now the physiologist is slowly making use of the recent developments in this department. Although we have to thank Emil Fischer and his pupils for most of the important work done in this subject within recent years, still their work has been ably supplemented by others and very largely by French writers, among whom one of the most active has been the author of this work. It is a large and important treatise on the carbohydrates, covering the whole domain and giving very complete literature references. It consists of six parts, the first dealing with the general properties of the sugars, their structure and optical characters, transformations, and fermentability. The author refers to Fischer's recent work on the relationship between fermentability and configuration, and also to Büchner's work on the action of the zymase that produces alcoholic fermentation. He also deals fairly fully with the syntheses of the sugars; only here, of course, bearing in mind the immense amount of work that has been done recently, there are some unavoidable omissions. The second part deals with a subject of great importance—the polyatomic alcohols from which the reducing sugars are obtained. Chapters in this section deal with the general characters of these alcohols, and then with the special properties of the tetrites, pentites, hexites, and the higher forms. The third section, dealing with the reducing sugars, is the most important one in the book, and so most space has been devoted to it. No reader could desire a more lucid description of these sugars than is given by the author. The first chapter in this section is a general one on the properties of the reducing sugars, with a practical account of the various methods employed for their estimation. This latter part would have been more useful if it had been amplified. The pentoses and hexoses are very fully described, and very complete literature references are given. The fourth section deals with the hydrolysable sugars, bioses, trioses, and polyoses, and here the work that has been done by physiologists is more fully described than is usual in books of this kind. The two succeeding chapters deal with derivatives of the carbohydrates, acids (mono- and polybasic), osones, saccharines, and osamines. The work is altogether a most important contribution to the subject, and can be most heartily recommended to all who wish a reliable guide to that most interesting field of organic chemistry, the carbohydrates. T. H. MILROY.

The Johns Hopkins Hospital Reports. Vol. vii., Nos. 5, 6, 7, 8, 9. Baltimore: The Johns Hopkins Press. 1899.

THE whole of this volume is devoted, as Dr. J. C. Bloodgood says, to the consideration of operations on 459 cases of hernia in the Johns Hopkins Hospital, from June 1889 to January 1899, and to the special consideration of 268 cases operated on by the Halsted method—*i.e.* of the transplantation of the rectus muscle in certain cases of inguinal hernia in which the conjoined tendon is obliterated. Twenty-six sections, appendix, list of cases, and index of contents are given in 345 pages, and in addition a series of admirable photographs and tables of results are included. The different sections deal with deaths, acute infections, complications following operations, the ultimate results of operations, discussion of the steps of Halsted's method, problems in the operation upon inguinal herniæ, with special consideration of the obliteration of the conjoined tendon; operations for recurrent inguinal hernia, suppuration, the contents of the sac, strangulated hernia, operations in children, operation with cocaine anæsthesia, the immediate and ultimate condition of the testicle after operations for inguinal hernia, varicocele, hydrocele, castration by incision in the groin, operations for umbilical and ventral hernia, and so forth. It is clear that we have here an exhaustive record, and one which is given with most praiseworthy care and candour, and which deserves the highest commendation. It is unnecessary to describe Professor Halsted's operation, for it is well known in this country. It includes one feature which has not, so far, we believe, been much adopted by English surgeons. Dr. Halsted believes that the presence of the spermatic cord in the inguinal canal is conducive to relapse, and therefore it is transplanted. To enable this to be done (as is very clearly shown in fig. 4), the muscular fibres of the internal oblique and transversalis are cut through externally to the centre of Poupart's ligament, the cord is then transplanted into the upper portion of this cut, and the muscular fibres are brought together below and beneath it. Then the aponeurosis of the external oblique is sutured under the cord, which now escapes from the outer end of the wound in the aponeurosis. Finally, the skin is closed. One of the details of this operation consists in the reduction in the size of the cord by the excision of its veins. The ultimate results demonstrated that 109 cases with excision of the veins gave perfect results, whilst eighty-six in which the veins were not excised gave eight recurrences. Nevertheless, it has been found that this device must be used with caution, because in fifty of the earlier operations atrophy of the testicle occurred in eight. It was found that after excision of the veins swelling of the epididymis occurred, with subsequent atrophy, so that, as Dr. Bloodgood says, "the excision of veins in operations for hernia has been discontinued." Instead, Dr. Bloodgood recommends that the cord be split and the veins transplanted separately. In the earlier operations silk was used for deep sutures. Out of 116 cases closed with silk, twenty-eight suppurated, a proportion of 24·13 per cent., a much higher percentage than of many of the operators in this country who use silk; and this after the subtraction of several cases. In 104 cases silver wire was used, with ten cases of suppuration, a proportion of 9·6 per cent., which is the same proportion as that which I myself had recorded when using silk. But here again the author subtracts cases. In these cases the operator did not wear gloves. In 226 cases closed with silver wire, and in which the operator wore gloves, four suppurated, a proportion of 1·8 per cent. These figures are very striking. If not altogether in favour of silver wire, they at all events are in favour of the use of rubber gloves, and it will be interesting to see whether a surgeon who uses silk can get the same results when he likewise uses rubber gloves. When silver wire was originally used in this country, it not infrequently extruded, and, if we remember rightly, was supposed to have brought about some fatalities. Possibly, with more recent and more improved methods of technique, these objections may fall to the ground. Dr. Bloodgood's statistics certainly show that silver wire might be worthy of a fresh trial.

Ether was given for all the operations, and Dr. Bloodgood pithily remarks, that pneumonia following the general anæsthetic is the chief danger of operations for hernia.

The transplantation of the rectus muscle is probably put forward as a new method of treatment. Perhaps the expression "transplantation" is ill chosen. Fig. 8 shows well how, after the division of the conjoined tendon, the edge of the rectus abdominis muscles is exposed and fastened with deep sutures to Poupart's ligament. In performing Bassini's operation, we have ourselves often utilised the rectus in this manner, and have seen the same done by other surgeons.

Where so much is excellent, we may perhaps seem hypercritical in pointing out that some of the remarks upon hour-glass constrictions of the sac would not perhaps have been made had the writer referred to the classical works of Cloquet and Lawrence. In other places the author does not seem thoroughly acquainted with the literature of the subject. This is not perhaps particularly blameworthy, especially when we consider its vast proportions.

It is now generally recognised in this country that the success of the operation for the radical cure of hernia depends in no small degree upon the careful selection of cases. We do not, however, observe that the author addresses himself to this point. It is difficult to ascertain the ages of the patients, because the strangulated and non-strangulated patients seem to have been lumped together. Nevertheless, we observe that many operations were performed upon patients quite advanced in years.

The rare operations for the radical cure of umbilical and ventral and femoral herniæ are not given with quite the same amount of detail. As regards the last, some rather loose phraseology is used. For instance, it is said "in fifteen cases the sac was excised and closed, after which an attempt was made to approximate the available fascia by sutures over the femoral opening: the sutures also included Poupart's ligament." We cannot help thinking that if Dr. Bloodgood had been acquainted with Cooper's ligament, he would have availed himself of its services in the closure of the femoral ring.

In conclusion, we consider that this is a most valuable and praiseworthy addition to the literature of this important branch of surgery, and we cordially commend it to the perusal of British surgeons.

C. B. Lockwood.

Dictionnaire des termes de médecine. Français-Anglais. By H. de Meric, M.R.C.S. (Eng.). London: Baillière, Tindall, & Cox. 1899.

The second part of this dictionary contains the English equivalents for French medical terms. The first half, published some months ago, rendered English terms into their French synonyms, and promised well for the value which would accrue to English-speaking readers of French medical works when its companion volume appeared. Without wishing to refuse the second part all the credit due it as a most useful addition to a doctor's library, it must be admitted that it fails to reach the high level attained by its predecessor. Perhaps France lacks the great multitude of terms current in this country, and can only fill 240 pages, compared with the 394 of the English-French half. But the chief fault lies in the failure to include the diseases with composite names. For instance, no varieties of *paraplégie* or of *paralysie* are inserted, although numerous equivalents for the different forms are entered in the English-French volume. *Anemie* is unadorned by kind. Charcot's disease, *Maladie de Charcot*, is absent.

Apart from these omissions, the volume contains a large number of terms, the translation of which is frequently difficult, owing to their technical applications, which are not to be found in the run of French dictionaries, and which must therefore prove most useful to all those who may venture to read the writings of our Gallic *confrères* in the vernacular.

A. Lockhart Gillespie.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

Athletics and Bicycling in relation to the Heart.

Getchell (*Med. News*, N. Y., 8th July 1899) discusses bicycling and its effects on the heart, dividing the subject into the results in the untrained and in the trained. Among the untrained he reports three cases of acute dilatation, occurring in two cases to males of middle age while making the ascent of long hills on their bicycles, in the third in an older man with a fatty heart while riding on the level. A second danger is to be found in a possible permanent dilatation of the heart from continued strain, increased peripheral resistance, and from the presence of toxic bodies in the blood, produced by the excessive muscular exertions.

The claim that severe muscular efforts can have no deleterious results upon persons in a state of physical training, and who because of this feel no discomfort from their exertions, is open to question. In these, hypertrophy of the heart is by no means an uncommon sequel to long-continued bicycling, even although this be apparently innocuous at the time. Count the pulse of these cyclists after or during a ride at some speed, and although they have experienced no sense of fatigue, it will be found to have risen from 72 or 80 to 112 or 140; and this increased rate often has been maintained for hours on end. Rapid action usually spells overgrowth in time.

Regarding the age of cyclists, Getchell would prohibit children under 13 or 14 riding, save very lightly. In young adults the effects of over-bicycling upon the heart are not infrequent. A large number of the 9901 officers and men examined in Illinois during the war between the States and Spain, were rejected entirely because of "bicycle heart," hypertrophy, displaced apex beat, with rapid or irregular action.

Stengel (*Am. Jour. Med. Sc.*, Phila., November 1899) writes on the same subject, but with regard to athletics in general, not cycling alone. He also separates the trained from the untrained. In the untrained the area of heart dulness increases both to the right and left after severe efforts, with an apex murmur, accentuated pulmonary sound, and often a thrill. Probably dilatation of the ventricles and mitral incompetence is present, although in many cases the murmur is of cardiopulmonary or intraventricular origin. A commonly heard murmur in the pulmonary area in boys is often the result of over-exertion, and depends, he supposes, upon dilatation of the conus arteriosus. In the trained, violent exercise does not produce a temporary enlargement of the heart, but may cause a pulmonary murmur to appear without accentuation; if the athletics be continued for long, permanent hypertrophy may be brought about. The sudden discontinuance of regular athletic efforts, as for instance when a boy leaves school, or a professional runner retires from the track, is often followed by disease and deterioration in general health.

Williams and Arnold (*Trans. Am. Clin. Ass.*, 1899) examined the hearts of thirteen bicyclists who competed in a road race of twenty-five miles. In all, the heart, before the race, was acting vigorously and was slightly increased in size. After the race the heart dulness had increased towards the left; in most a murmur had developed, loudest over the second left intercostal space, and also heard at the apex and axilla. The pulse rate varied from 104 to 120, save in two cases, with 60 and 70, who were especially exhausted. The body temperatures fell 2° to 5°, while albumin and casts were found in the urine of every one of the competitors.

Kisch (*Ztschr. f. diätet. u. physik. Therap.*, Leipzig, Bd. ii. Heft 4) regards the training of the heart muscle, along with the regular exercising of the whole muscular system, following on cycling, as beneficial to patients with fatty hearts in moderate degree, if there be no actual cardiac insufficiency. It is especially to be allowed to the stout who live a sedentary life. On the other hand, it must be forbidden to those who are both stout and anæmic, especially if they exhibit signs of arterio-sclerosis. As a rule, however, the bent attitude common in cycling, the increased pressure exerted by the abdominal walls on the abdominal aorta, and the psychical stimulation, tend to interfere with the mobility of the respiratory mechanism, and heighten the amount of work of the heart.

Other recent papers on the effect of exercise upon the heart have been published by Altschul (*München. med. Wchnschr.*, 1898, No. 48), Litten (*Ztschr. f. Krankenpfl.*, Berlin, April 1898).

EXTREME BRADYCARDIA.

FENWICK and Parker (*Bristol Med.-Chir. Journ.*, June 1899) report a case of abnormally slow pulse. Bradycardia may be due to extracardiac causes, to lesions of the heart itself, or to combined lesions such as arterio-sclerosis of the heart and medulla, as postulated by Huchard. The difficulty attendant on cases of this condition depends upon the decision as to which of these causes the slow action of the heart is due. The patient whose case they record, a male, æt. 58, stout, temperate, had usually been in good health, but for about ten years had complained of failing sight and attacks of giddiness. Strain of the eyes produced the latter, which were sometimes accompanied by syncopal symptoms. His pulse rate when examined was found to vary very markedly within a few hours. The lowest rate noticed at first was 16, while each time the rate slowed more or less pronounced epileptiform convulsions appeared. Great improvement in his condition followed, to be succeeded a month or so later by a fresh series of attacks, attended with Cheyne-Stokes symptoms. He gradually grew worse, and died comatose; the pulse rate three days before death only reached 11 beats per minute, remaining at this figure for four hours; subsequently ranging from 14 to 70. At the post-mortem a gummatous cicatrix was noted in the liver, and patches of atheroma in the vessels at the base of the brain; the heart was normal save for some areas of fibroid degeneration. Examination of the eyes before death, by Cross, showed the right eye to be sound and with good vision. Well-marked optic neuritis was present in the left eye, with the rare condition of altitudinal hemianopsia; the lower half of the field of vision being lost, as well as that of the centre. This was due to a local lesion in the left optic nerve. Later on the same form of hemianopsia appeared in the other eye. Double optic atrophy supervened.

Barker, discussing the case, points out the analogy between paroxysmal tachycardia and the symptoms shown by it. He looks on the case as one of paroxysmal bradycardia occurring in a patient with fibroid degeneration of the myocardium, slightly atheromatous coronary arteries, excited by changes in the cerebral circulation, eye strain, and digestive disturbances.

THE APEX-BEAT.

KIRCHNER investigated the relationship between the position of the nipple and the apex-beat in 905 young, healthy, adult males (referred to *Centralbl. f. innere Med.*, Leipzig, 1899, No. 28). In 449, or nearly half, of the cases the left margin of the heart and the apex-beat coincided with a perpendicular line drawn through the left nipple; in 217, or one-fourth, it lay within; and in 234, or a little more than one-fourth, without this line. The fact, however, of so many showing apparent projection of the heart's area to the left, by no means proved them to possess enlarged hearts, or to suffer from any disease. In all such cases the distance of the nipple from the median line of the body, the body weight, and the formation of the lower thorax, have to be taken into account, the position of the apex-beat depending upon these factors. In many of the instances where the apex-beat is palpable to the left of the mammary line, the nipple is placed relatively nearer than it usually is to the middle line, the body weight is high, or the lower thorax is of small depth.

Schultess (*Deutsches Arch. f. klin. Med.*, Leipzig, Bd. lx. Heft 2), in fifty healthy females, found the apex-beat to be placed in the fifth intercostal space in the mammary line in thirty-one, or 62 per cent.; in six it was outside, in seven within the line. In six the apex-beat was located in the fourth intercostal space, in three to the left, and in three within the mammary line.

MEASURING ARTERIAL PRESSURE.

Riva-Rocci (*Presse méd.*, Paris, 22nd November 1899) describes a form of sphygmomanometer suitable for clinical use, which he originally brought forward in 1896. Based upon similar principles to the instruments of Potain and Basch, it is designed for application to one of the larger arteries, especially the brachial, not, as in the case of the other two, to vessels of more moderate size. The chief part is played by an encircling rubber tyre buckled round the arm, the cavity of which is air-tight, save for a rubber tube communicating with a manometer, and through it with an ordinary Richardson's air syringe of rubber. The pressure of air required to be produced within the hollow rubber band, so that by its dilatation the brachial artery is compressed and its blood stream arrested, as indicated by the radial pulse, is depicted on the manometer, and can be read off.

Weiss (*München. med. Wchnschr.*, January 1900) deals with the estimation of the blood pressure by means of Gärtner's tonometer (described *Wien. med. Wchnschr.*, 1899, No. 30). This instrument is applied to a finger, the amount of pressure required to prevent the continuance of circulation in it being measured on very similar lines to those employed in the former method, by means of a manometer. Weiss found the blood pressure especially high in arterio-sclerosis, and notes that, in cases where the aorta may be sclerosed without any palpable sign of this change in the peripheral arteries, the tonometer is of value in diagnosing the condition.

Some results obtained by the use of the tonometer in children are recorded by Shaw (*Albany Med. Ann.*, 1900, p. 88), the outcome of a series of 400 measurements of the arterial tension at Graz, in Austria.

THE SPHYGMOGRAPH.

Sandvoord (*Med. Rec.*, N. Y., 24th February 1900), giving an address to the New York Academy of Medicine as its president, analyses the results obtained by himself from the use of Dudgeon's sphygmograph during fifteen years. After explaining the technical points of the instrument, pointing out *en passant* that the size of the vessel employed influences the significance of the results, the form of a tracing is "a more accurate record of the absolute tension of the vessel than the amount of pressure required to develop it," he states that methods such as the sphygmomanometers of von Basch and others, indicated by the pressure required to arrest pulsation beyond the tension present, are attended by three drawbacks. The exact point of cessation of pulsation is not easy to determine, the measurement of the pressure varies with the surface compressed, and the maximum point of each cardiac cycle is only ascertained, no variations being registered. The latter is a matter of importance. One of the chief advantages of the instrument is the power it gives of detecting conditions of high arterial tension in the earlier stages. Sandvoord believes that excessively low arterial tension may form a factor in the causation of heart strain, much as high tension is known to act. Such low-tension cases exhibit a great tolerance towards digitalis. The idea that marked relaxation of the peripheral vessel walls has a decided influence in bringing about cardiac embarrassment, has not been borne much in mind. He sums up, that in spite of some "confessed limitations and sources of error, a review of a considerable number of tracings taken by me during the last fifteen years shows so constant a recurrence of certain types whose readings harmonise with the clinical history of the cases and with the post-mortem findings, when it has been possible to obtain autopsies, that I have come to regard the sphygmograph as of very considerable practical value in diagnosis, and its sources of fallacy no greater than in many other methods of investigation which we would not think of discarding."

SURGERY.

UNDER THE CHARGE OF

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ACUTE OSTEOMYELITIS IN THE VICINITY OF THE HIP-JOINT.

Bruns and Housell present the following report on a series of 106 cases, which have been under treatment at the clinique in Tübingen. [During the same period there have been 500 cases of osteomyelitis of the lower end of the femur.]

The hip lesion may originate in the acetabulum or in the upper end of the femur, the latter is the more common; many cases run their course without suppuration; extensive necrosis is exceptional; separation of the femoral epiphysis is usually accompanied by destructive changes in the joint.

The disease usually affects children, who present the appearances of perfect health; it begins acutely with shivering, high fever, and severe pain, necessitating confinement to bed from the first onset. The region of the hip soon presents a uniform, doughy swelling. If suppuration occurs, it usually makes its way to the surface, and results in multiple sinuses. Among the sequelæ of the disease may be mentioned contraction or actual ankylosis, with or without shortening of the limb, separation of the epiphysis, spontaneous fracture of the neck of the femur; dislocation occurs in nearly one-third of the cases, usually backwards and upwards. The disease terminated fatally in fifteen cases. The diagnosis may be materially assisted by skiagraphs and by rectal examination in those cases which originate in the acetabulum. The treatment is carried out on the same lines as in osteomyelitis elsewhere.—*Centralbl. f. Chir.*, Leipzig, 2nd March 1900.

PATHOLOGICAL DISLOCATIONS IN ACUTE INFECTIVE DISEASES.

Degez observed a dorsal dislocation of the hip in a little girl, æt. 6½, who had been suffering from a severe attack of scarlet fever, complicated with purulent otitis, for four and a half weeks; the dislocation took place suddenly. Treatment was delayed on account of whooping-cough until four months later, when the dislocation was reduced under chloroform without much difficulty. Skiagraphs showed the condition of affairs before and after reduction, also partial destruction of the upper and posterior rim of the acetabulum.

Degez has collected the records of eighty-one similar cases, thirty-two following typhoid fever, twenty-four after acute articular rheumatism, and thirteen after scarlet fever. The dislocation involved the hip in seventy-four cases, the shoulder in three, the knee in three, the elbow in one. The joint is so weakened by inflammatory changes in the ligaments, that the dislocation takes place from trivial causes. The deformity of the limb is, as a rule, the first indication of its occurrence. Reduction is usually very satisfactory; in one-half of the total recorded cases it was achieved by manipulation alone; extension was required in seven; preliminary tenotomy of the shortened tendons was necessary in three; reduction by open operation was had recourse to in eleven.—*Centralbl. f. Chir.*, Leipzig, 2nd March 1900.

FRACTURE OF THE NECK OF THE FEMUR IN CHILDHOOD AND COXA VARA.

ROYAL WHITMAN of New York again draws attention to the neglected subject of *fracture of the neck of the femur in childhood.* During the last ten years he has observed no less than eighteen cases, of which eight were boys and ten were girls, between the ages of 10 and 16 years. They were mostly the result of falls from a considerable height. The clinical signs are characteristic. The child, previously in perfect health, presents an actual shortening of the limb of from ½ in. to ¾ in.; the trochanter is elevated and prominent; there is slight eversion of the limb; while recovery may be perfect, there is sometimes some restriction of movement in extreme abduction, flexion, and internal rotation, and a slight limp in walking. The lesion, as met with in childhood, differs from the common fracture of the neck of the femur in adults, in that it does not usually entail the immediate helplessness and persistent disability; in many cases the child is able to walk about within a few days of the accident, probably because the fracture is of the incomplete or greenstick variety. It is in virtue of this that most of the cases have come under the author's observation at different orthopædic clinics, at varying periods after the accident (four within the first month, seven within two months, five within six months, and two over a year). A further peculiarity in children is that the deformity and disability, although at first slight, may become exaggerated and assume the features of a progressive coxa vara. Whitman refutes the opinion of Sprengel of Brunswick, that the former's first series of cases of fracture of the neck were in reality cases of separation of the upper femoral epiphysis, most conclusively, by figuring the specimen removed by operation in one of his cases, the line of fracture having passed through the narrowest portion of the neck and distinctly below the epiphysial junction. Whitman argues, further, that fracture of the neck is more likely to occur in children, because the epiphysial junction is stronger and better protected, and also because any epiphysial separation, accompanied by

½ in. or more of shortening, would be attended with greater impairment of the movements at the hip-joint. On the other hand, separation at the epiphysis is more likely to occur in adolescents, when the peripheral cartilage and the resistant covering of periosteum have diminished to nearly the condition met with in the adult, so that separation may occur from comparatively slight violence.

Coxa vara, of which fracture of the neck of the femur in childhood is, practically speaking, the traumatic form, is a deformity at the hip corresponding to genu valgum or varum. It differs from them in that, as the distortion is concealed from view, its diagnosis in the early stage must depend upon a proper interpretation of the symptoms; these are caused by the deformity and by the weakness accompanying it. In most instances the depression of the neck of the femur is backward; thus, there is an elevation and prominence of the trochanter, and a corresponding shortening of the limb, which is rotated outward. Motion is somewhat limited in abduction, flexion, and inward rotation. If, as in rare instances, the neck is depressed in a forward direction, outward rotation and extension will be restricted in place of inward rotation and flexion. In all cases, the limp is the most striking symptom; with this there is often complaint of discomfort, particularly of stiffness, referred to the hip and thigh; and if the deformity is progressive, as in adolescence, these symptoms may be increased to actual acute pain, particularly after exertion or if aggravated by injury. The limp, in quiescent cases, is caused by actual shortening; as the deformity progresses it is exaggerated by the upward tilting of the pelvis, in compensation for the restricted range of abduction. Tilting of the pelvis may be present before the range of abduction is greatly restricted. Bilateral coxa vara differs from the unilateral form, only in its effects on the gait and attitude. Unilateral coxa vara, as well as fracture of the neck of the femur in children, is usually mistaken for *disease of the hip-joint*, although the distinction between the two is well marked. In coxa vara the shortening of the limb, the displacement and prominence of the trochanter, are present from the first; the motion of the joint is restricted in certain directions, and is unrestricted in others; while, in hip disease, motion is usually checked in all directions. During the last eight years Whitman has treated thirty cases of coxa vara, twenty-two in boys, eight in girls; the deformity was unilateral in twenty-five (right, fifteen; left, ten), bilateral in five. The neck of the femur was displaced downwards and backwards in twenty-seven, downwards and forwards in three. Five cases affected children under 5 years, ten cases under 11 years, fourteen cases between the ages of 12 and 17. For further details we must refer the reader to the original article.—*Ann. Surg.*, Phila., February 1900.

THE OPERATIVE TREATMENT OF GASTROPTOSIS.

ROVSING reports three cases with severe symptoms from simple, uncomplicated gastroptosis, all of which were cured by the following simple operation. Three silk sutures were passed through the serous coat of the stomach at different levels, and on either side are brought through the abdominal wall from within outwards. After closure of the abdominal wound, the three sutures which were passed through the stomach are knotted over rolls of gauze. It is recommended to scarify the parietal peritoneum, against which the stomach is to be brought, to insure the formation of the desired adhesions. If other abdominal organs are involved in the proptosis, they should be sutured in place, either at the same time or upon another occasion. The most marked case of gastroptosis observed by the author was that of a woman, whose weight was reduced from 140 to 56 lb., and who died of what the author describes as "gastroptosis cachexia." Nothing else was found on post-mortem examination except a recent tuberculosis. The after-treatment of cases of gastroptosis subjected to the operation above described, consists in the wearing of a proper supporting bandage, and in avoiding the use of a corset or other constricting bands, and in suspending the clothes to the shoulders.

THE ETIOLOGY AND TREATMENT OF PROLAPSE OF THE RECTUM.

LUDLOFF supports the view that the ordinary prolapsus recti is to be regarded as a hernia, and is to be distinguished, on the one hand, from prolapse of the anus, which is an ectropium of the mucous membrane, and, on the other, from the more acute prolapse of the colon, which is, properly speaking, an intussusception. In its production, the chief factor is the intra-abdominal pressure, which, by projecting downwards the pouch of Douglas, draws down the anterior wall of the pelvic portion of the rectum; there arises in this way a perineal hernia, which in turn causes prolapse of the rectum after its muscles have become relaxed and its attachments elongated. The anterior wall of the rectum may be regarded as the sac of the hernia in the first instance; the posterior wall duly follows, because of its loose attachment to the hollow of the sacrum. Exciting factors in the production of the prolapse are those which give rise to straining, namely, constipation, diarrhœa, phimosis, stone in the bladder, whooping-cough, etc. As regards the operative treatment of prolapse, the author does not recommend the resection of the protruded bowel, for this may be attended with the liability to recurrence, and to stricture at the line of suture; it is also undesirable that the bottom of Douglas' pouch should be so near the surface. Fixation of the sigmoid colon and mesocolon to the abdominal wall (colopexy) is regarded more favourably. In the experience of the abstractor, it is much to be preferred, only it must be carried out thoroughly, in order to prevent a recurrence of the prolapse. If the uterus is also prolapsed, it should be fixed to the anterior abdominal wall (hysteropexy) at the same time. The author has devised an ingenious operation, which consists in cutting across the sigmoid flexure, implanting the central in the peripheral end, and stitching the latter, after closure, into the abdominal wall; he has not yet practised it on the human subject.

ADHESION OF THE STOMACH TO THE LIVER.

ROUTIER records the case of a woman, æt. 35, who had suffered for fifteen years from gastric symptoms, with frequent vomiting; she had become extremely emaciated and addicted to morphine. The stomach was much dilated, and yielded splashing sounds. On opening the abdomen, the lesser curvature of the stomach was found to be adherent to the liver; in separating the adhesion, the gastric wall was torn to the extent of a crown piece; this was sutured, and a gastro-enterostomy was carried out by means of a Murphy button. The patient made a complete recovery.

VOLVULUS OF THE SIGMOID FLEXURE.

ROUTIER also records the case of a woman, æt. 47, who had had obstruction of the bowels for five days. The abdomen was enormously distended. It was impossible to diagnose the nature or seat of the obstruction. On opening the abdomen, he found a volvulus of the sigmoid flexure. After undoing the volvulus, the gas passed into the rectum, and partially escaped per anum. Two large drainage tubes were introduced into the rectum, and saline solution was allowed to flow in through one of them. Enormous quantities of fluid fæces and gas were evacuated, so that the distended bowels collapsed, and were easily replaced within the abdomen. Recovery was uninterrupted.—*Centralbl. f. Chir.*, Leipzig, 24th February 1900.

CHRONIC OBSTRUCTION IN CHILDREN FROM MALFORMATION OF THE COLON.

CONCETTI of Rome distinguishes three forms of congenital malformation of the colon—(1) General elongation of the colon, with corresponding increase in the number of flexures; (2) congenital dilatations of the colon and thickening of its wall; (3) localised dilatations. The second of these is the best known, particularly in this country, having been specially described by Frederick Treves. It is characteristic that the child is unable to pass wind, and that, when a tube is passed up the rectum, flatus escapes under considerable pressure. There is apt to be kinking of the bowel at the junction of the sigmoid flexure with the rectum, or it may be that this is the primary lesion, and the dilatation of the colon a secondary result.—*Centralbl. f. Chir*, Leipzig, 24th February 1900.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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THE RELATION OF INSANITY TO PELVIC AND OTHER LESIONS.

A. T. HOBBS (*Am. Journ. Obst.*, N. Y., Jan. 1900) refers to the frequency with which insanity and pelvic lesions in women are coincident. In 1895 systematic investigation was made into the sexual history of the female inmates of the London Asylum, Ontario; and some of the young and middle-aged women, who had married and borne children, were examined under an anæsthetic, and revealed the fact that pelvic disease was the rule and not the exception.

During the past five years, 220 women have been examined, and in 188, or 85 per cent. of those examined, disease of the pelvic organs was found, representing 23 per cent. of the insane female population. The conditions found were subinvoluted uteri or endometritis, or both, 132; dysmenorrhœa or menorrhagia, eighteen; diseased or lacerated cervices, sixty-two; cervical polypi, five; retroverted or prolapsed uteri, sixty-six; new growths, eighteen, sixteen of which were myxomatous and two malignant; thirty-three had marked disease of the ovaries and tubes. In all there were diagnosed 371 lesions in 188 patients; 173 of these were operated upon with the following results:—(1) After the removal of ovarian and tubal disease, there occurred a return to sanity in fifteen, or 63 per cent.; an improvement in four, or 17 per cent.; no change in three, or 12 per cent.; and two, or 8 per cent., died from pneumonia. (2) In seventy-two cases, in which disease of the lining membrane of the body or neck of the uterus was corrected, thirty-three, or 46 per cent., recovered mentally; fourteen, or 19 per cent., improved; and twenty-five, or 35 per cent., remained stationary. (3) Correcting retrodisplaced or prolapsed uteri, in forty-seven cases, was followed by mental recovery; in seventeen, or 36 per cent., improvement; in twelve, or 26 per cent., no change; in seventeen, or 36 per cent., and in one, or 2 per cent., death resulted from hæmorrhage, caused by the patient tearing away the ligatures. (4) In twenty cases tumours were removed, succeeded by six recoveries, or 30 per cent.; eight improved, or 40 per cent.; five unimproved, or 25 per cent.; and one, or 5 per cent., died. (5) Repair of injuries to the vagina, in ten cases, resulted in mental recovery in two, or 20 per cent.; improvement in three, or 30 per cent.; and failure in five, or 50 per cent. To sum up, out of 173 cases operated upon, seventy-three, or 42 per cent., recovered mentally; forty-one, or 24 per cent., improved mentally; in fifty-five, or 32 per cent., there was no improvement; and four, or 2 per cent., died. The author goes on to urge the necessity of examining into the sexual history and condition of insane females.

A NEW OPERATION FOR PERSISTENT INVERSION OF THE UTERUS.

HIRST (*Am. Journ. Obst.*, N. Y., Jan. 1900) criticises the various operations in use for treating chronic inversion of the uterus, all of which he considers unsatisfactory and many of them dangerous to the patient, and describes a new method. The obstacle to the reduction of an inverted uterus is the contracted ring muscle of the cervix. He therefore cuts the cervical muscle in two, which can be done in a few seconds, without opening the peritoneal cavity, without danger, and with the result of immediately removing the only obstacle to replacement. He illustrates his operation by the following case:—The patient, æt. 19, was brought to the Howard Hospital on 15th Nov. 1899. She was delivered on 17th August, after a prolonged labour; no instruments were used. The placenta was adherent, and was removed manually. Reposition of the uterus was attempted by the attending physician at the time of the accident, but without avail. Next day a gynæcologist saw her, and also failed to replace the uterus; the following day and also two weeks later unsuccessful attempts at reduction were made. When Hirst saw her there was complete inversion, good involution, and a very firmly contracted cervix. Taxis under ether proved unsuccessful. The cervix was then cut in two in the median line posteriorly, the incision being carried higher on the internal than on the external surface, the ring muscle being thus almost, if not completely, severed without opening the peritoneal cavity. Then comparatively light pressure, with one finger-tip in the lower uterine segment just above the upper angle of the wound, reinverted the uterus easily. The cervix was then joined again by sutures. The whole operation scarcely required fifteen minutes, and the patient made an afebrile recovery, the uterus remaining in good position.

CEREBRO-SPINAL MENINGITIS SIMULATING ECLAMPSIA.

A PATIENT, æt. 34, was sent to Hospital with the diagnosis of eclampsia. She had had one preceding pregnancy, which was normal. For a few days she had slight malaise, followed by convulsive attacks and coma; temperature normal. Albuminuria was present, with casts, but there was no pain. There was no herpes, nor rigidity of the neck. The os was closed. The next few days the temperature rose to 104°, with a pulse of high tension. Venesection was performed without result. Cæsarean section was performed, and a living child delivered, but the mother died five hours after the operation. The post-mortem revealed meningitis, with purulent exudation, containing numerous extra- and intra-cellular diplococci.—*Hosp.-Tid.*, Kjöbenhavn, 1899, p. 295.

INTRA-UTERINE IMPLANTATION OF THE OVARY.

THE patient, æt. 21, was suffering from double pyosalpinx; she had had one miscarriage, but no children. Laparotomy was performed, and the double pyosalpinx removed, leaving in place the right ovary. The fundus uteri was then incised, and a place prepared on its inner surface for the reception of the ovary, which was fastened there by deep and superficial sutures, after being excised and washed in salt solution. The ovary was retained, and the next two menstruations occurred at the normal times.—Palmer Dudley, *Ann. de gynéc. et d'obst.*, Paris, August and September, 1899.

LABOUR COMPLICATED BY CONTRACTED PELVIS, LARGE FIBROMA OF UTERUS, AND ECLAMPSIA.

ON 11th April the author was asked to see a mulatto woman, æt. 37. The patient was in charge of a midwife, who had been waiting for a number of hours for labour to terminate spontaneously. She had had a violent convulsion about half an hour previously. She was partly conscious, but not rational. The patient was markedly rachitic, the femora and tibiæ markedly curved, and a pronounced lordosis in the sacrolumbar region. On palpation it was found that the pelvis and abdomen were filled by a large tumour. In the right hypochondriac region there was a bulging mass about the size of a cocoanut, apparently connected with the larger growth but separated from it by a sulcus. On auscultation, no fœtal heart sounds nor uterine souffle could be detected. By vaginal examination the os was only sufficiently dilated to admit one or two fingers, and on pushing the finger into the uterus nothing that even simulated a presenting fœtus could be felt. The uterine neck was not obliterated, and a slight protuberance was felt along one margin, suggesting an intra-uterine growth. The pelvis was contracted antero-posteriorly. From the shape of the tumour it appeared that, if the woman was pregnant, the presentation was transverse, but too high up to be reached by the examining finger, per vaginam. No fœtal parts could be detected by abdominal palpation. Between 3 P.M. and 10 A.M. she had twelve convulsions, and had passed no urine since 2 P.M. Operation was determined upon, and at 10 P.M. the abdomen was opened. The tumour was found to be uterine, but lacked the appearance of the pregnant uterus; the large nodule over the liver was continuous with the main growth; no indication of a fœtus could be felt. The whole mass was removed, when it was found that the upper part, which had formed the mass projecting under the ribs on the right side, contained a placenta and a dead fœtus weighing 6 lb.; the whole tumour with the placenta weighed 20 lb. The patient never regained consciousness, and secreted no urine from 2 P.M., 11th April, till 5 P.M., 12th April, when she died of uræmic coma.—Ballard, *Am. Journ. Obst.*, N. Y., Jan. 1900.

THERAPEUTICS.

UNDER THE CHARGE OF

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SUBCUTANEOUS INJECTIONS OF GELATIN SOLUTION IN HÆMOPHILIA.

ON the 1st of May, Heymann removed adenoids from the pharynx of a man, æt. 23, who consulted him on account of severe and frequent nasal hæmorrhages. As the bleeding after the operation did not cease at the usual time, Heymann made inquiries, and found that he had to deal with a bleeder. All the usual remedies, including anterior and posterior plugging, were tried in vain. The patient was in a very exhausted state, and, as a last resort, Heymann tried gelatin injections subcutaneously. He made a 2½ per cent. neutral sterile solution in physiological salt solution. Of this, 140 c.c. (about 5 oz.), heated to 40° C., were injected under the skin of the chest. The bleeding soon became less, in three-quarters of an hour ceased altogether, and did not recommence till thirty hours after, when it was necessary, on account of the foul odour, to remove the tampons. Immediately previous to the removal, 240 c.c. of gelatin solution were injected. Despite all care in removing the tampons, the bleeding recommenced, and the plugging had to be immediately renewed, when it soon ceased again. Next day (4th) 140 c.c. were injected; on the 5th one of the tampons came away without any bleeding, and on the 6th the other was successfully removed. After the 7th May plugging was unnecessary. Recovery was then uninterrupted, and the patient was discharged on the 20th May. In this case Heymann considers that the gelatin injections had a very marked effect. This is very well seen from the behaviour of the injection pricks. Thus, from that of the first injection, the bleeding was so free that only after a quarter of an hour of steady pressure was it possible to apply sticking plaster; with the second injection, which was made at a little distance from the first, the bleeding was less but still required prolonged pressure. The bleeding from the third injection was controlled by the mere application of sticking plaster.

The injections themselves caused no trouble. The feeling of tension diminished under light massage, which caused the fluid to be absorbed in ten minutes. After the third injection the temperature rose to 39°·1, but this, however, was very likely due to the decomposing secretions in the throat and nose.—*Munchen. med. Wchnschr.*, Aug. 22, 1899.

TREATMENT OF EPILEPSY BY SODIUM BROMIDE, COMBINED WITH A DIET POOR IN CHLORIDES.

RICHET and Toulouse, after dwelling on the value and inconveniences of large doses of bromides in treating epilepsy, state that by diminishing the ingestion of chlorides the cells become more sensitive to the bromide action. This is due to the fact that, when chlorides are withheld, the tissues take up bromides more freely. Thirty epileptic patients were put on the following diet:—Milk, 100 grms.; beef, 300 grms.; potatoes, 300 grms.; flour, 200 grms.; two eggs; sugar, 50 grms.; coffee, 100 grms.; butter, 40 grms. This gives 2700 calories, and 20 grms. nitrogen, and about 2 grms. NaCl. The ordinary amount of sodium chloride taken per day varies from 10 to 15 grms. In these cases 2 grms. (30 grs.) bromide of sodium per diem sufficed to ward off the epileptic attacks. Certain of them, on returning to an ordinary diet, with the increased amount of sodium chloride, became again subject to epileptic fits unless the bromide was greatly increased. The dietary proved quite sufficient in most cases. But bromism was very apt to occur. The best plan is to allow about 3 to 5 grms. sodium chloride per day, and increase the bromide as may be necessary. The authors think that in the same way the tissues may be brought more forcibly under the action of such drugs as quinine, digitalis, atropine. They propose the name *méthode metatrophique* for it.—*Arch. méd. Belges*, Bruxelles, Dec. 1899.

PERIPHERAL NEURITIS IN CASES OF CHOREA TREATED WITH ARSENIC.

RAILTON (*Med. Chron.*, Manchester, Feb. 1900) states that in the Manchester Clinical Hospital cases of chorea are treated with arsenic in preference to any other remedy. It shortens the duration of the illness, and, in the great majority of cases, is followed by no ill results, as children bear it well even in full doses. But caution is required in its use. Certain children cannot take even small doses of Fowler's solution without showing symptoms of gastric irritation—foul breath, coated tongue, vomiting, and diarrhœa. Bronzing of the skin is very rare in children, but it sometimes occurs to a moderate degree. Changes in the texture of the skin, rashes, and atrophic paralyses are still less common. The skin may become roughened or may peel off; œdema of the eyelids and irritation of the conjunctiva are scarcely ever seen in children. During ten years, 312 cases of chorea have been treated with arsenic, and in very few was there any necessity to stop the drug. Four cases of peripheral neuritis occurred among these. The first was a girl, æt. 12, who during three weeks received ten drops liquor arsenicalis thrice daily, equal to 6·3 grs. of arsenious acid. She developed complete paralysis of the legs and arms, only a few of the muscles escaping. There was great wasting of their substance. The other cases were much the same, the paralysis gradually developing after the arsenic was left off. All made a good but slow recovery.

INDICATIONS FOR MILK DIET IN TREATING ALBUMINURIA.

MABBOUX (*Lyon méd.*, 11th February 1900) states that, as soon as albuminuria is detected, it is too much the custom to put the patient on a strict or partial milk diet. The simplicity of the method, and a too great tendency to generalise, seem to be accountable for this. Von Noorden, Lancereaux, and others have protested strongly against it as a routine practice, the second-named holding that it is only advisable in desquamative nephritis, and not in the interstitial variety.

Mabboux advises as follows:—Great care should be taken to determine whether the albuminuria is functional or due to a kidney lesion, which can only be determined by a prolonged and careful investigation of the patient's antecedents and habits. If it be concluded that there is a chronic nephritis, the medication must assume a depurative character, as no medicines are capable of curing the disease. Milk is very valuable in such cases. In functional cases, however, the cause may be nervous, gastro-hepatic, gouty, or due to gravel, rapid growth, or menstrual disorder, and here treatment should be directed to the cause. As a result of neglect, such transient albuminuria may become permanent, owing to chronic injury of the renal epithelium. In these cases milk may be largely used or not, as may seem best in regard to the general health and nutrition, and its digestibility in individual instances.

ANTITOXINE AS AN IMMUNISING AGENT IN DIPHTHERIA.

JOHN S. BILLINGS, jun., puts in a plea for the more extended use of diphtheria antitoxine for immunising purposes (*New York Med. Journ.*, 17th February 1900). In New York the antitoxine treatment was introduced in 1895, and there occurred at once a fall in the percentage mortality. From 1891 to 1894 the deaths had numbered from 29·7 to 40·6 per cent. of cases, but thereafter they have varied from 12·2 to 19·1 per cent. He considers that, owing to its many channels of infection, and the difficulties of isolating children among the poor, diphtheria can never be eradicated in large urban communities. Hence the antitoxine serum, while a specific and effective remedy and capable of lessening the number of deaths, cannot alone bring about any marked reduction in the number of cases. Inspection, isolation, and disinfection are all systematically carried out by the public health authorities. In 1898, 1711 immunising injections were made, and of these cases only three afterwards became infected. Out of 3109 individuals so protected, only nine contracted the disease, and did so in a mild form. The dose was 150 units, and Billings proposes 300 to 500 units for future use, to insure more complete protection. Infection is much more common when a protective injection is not given to the other children in a family.

INSANITY.

UNDER THE CHARGE OF

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THE CLINICAL POSITION OF MELANCHOLIA.

AFTER discussing the various changes in opinion regarding this subject, Kraepelin (*Centralbl. f. Nervenh. u. Psychiat.*, Coblenz u. Leipzig, October 1899, S. 582) states the present view to be, that melancholia is looked upon as a phase in the course of many mental affections. Many of the so-called melancholias reveal themselves as periodic diseases, while others belong to the groups of katatonia or dementia præcox. Even some of the most pronounced cases of melancholia manifest in abundance the symptoms observed in circular forms of insanity. It is of the greatest importance to distinguish in the early stages the circular forms from melancholia proper. The age of the patient affords an essential point of diagnosis. In most young persons, before the age of 30, the symptoms are seldom uniform, as in the curable cases, but conform more to the symptoms met with in circular insanity or dementia præcox. Another distinctive point of diagnosis is the temporary mental arrest (Hemmung) which is always characteristic of the depressed stage of circular insanity. This mental arrest must not be confounded with stupor or partial fixation of the attention. The differential diagnosis between simple melancholia and premature dementia is, however, very difficult to establish. A large number of cases of melancholia end in dementia. By a more careful consideration of the more pronounced peculiarities of the cases, one is often prepared at the very commencement to give an unfavourable prognosis.

The great mass of melancholias, which do not belong to the class of circular affections or to premature dementia, begin for the first time in later life. Many of them are old age degenerating cases, and, with the exception of a few cases which end in dementia, they are curable.

With regard to the incurable cases among the latter, it is well to find out early what is often present, namely, a long existing mental weakness, which is of great diagnostic significance, and one for the detection of which psychological research methods might, with advantage, be employed. Another difficulty in the differentiation of melancholia is found in those senile cases in which symptoms of katatonia are present along with profound mental depression. The progress of such cases is undoubtedly towards dementia, and from such cases the curable melancholias of the senile period have to be sharply distinguished.

The Central Nervous System in Acute Malarial Infection.

Dr. James Ewing (*Journ. Nerv. and Ment. Dis.*, N. Y., November 1899, p. 701) reports three cases, with autopsies, illustrative of and introductory to his paper on the above subject. Commenting on these cases, the writer states that when the brain was markedly brownish in colour, it indicated usually the presence of a large number of parasites, but this was not an invariable rule. The majority of cases of comatose malaria did not exhibit the massing of the parasites in the brain. Of eight cases in which he had examined the brain after death, in none was there a distinct brownish discoloration. Hæmorrhages had been found in some cases, as had also a moderate degree of œdema. Usually the parasites were uniformly distributed in the brain and cord, but a case had been reported in which they were localised in the medulla. The number of these parasites was often enormous, and complete occlusion of the vessels was not at all uncommon. While most of the fixed pigment was found in the endothelium, the parasites were rarely seen in the endothelial cells. It was probably safe to refer the cerebral symptoms observed in these severe cases of malarial infection to the general condition of the obstructed circulation. Chromatolysis in various stages was found in the nerve cells, but they appeared to suffer less than in the average case of typhoid fever. The dendrites were usually involved before the cell body. The cases in which only crescents were found in the blood, appeared to be rather more frequently attacked by coma. The writer does not believe that much importance need be, at the present time, attached to the condition of the nerve cells in malaria. When the coma resulted from the massing of the young parasites in the brain, it was generally gradual in onset, and the prognosis was very unfavourable. In some cases the coma developed suddenly and was more amenable to appropriate treatment. The general clinical character of these cases indicated that an embolic process was concerned in their causation. His conclusions are, that there are three anatomical conditions underlying malarial coma—(1) The mechanical obstruction of the cerebral capillaries by large numbers of young parasites; (2) an embolic process causing occlusion of some vessels (usually temporary) by parasites or pigmented leucocytes; and (3) a general toxæmia, such as might occur in other infectious diseases, the blood showing few, if any, autumnal rings.

THE TREATMENT OF EPILEPSY.

FÜRSTNER (*Centralbl. f. Nervenh. u. Psychiat.*, Coblenz u. Leipzig, Dec. 1899, S. 708) discusses at length the different forms of epilepsy and their amenability to treatment by the bromide salts. He is a thorough believer in the efficacy of bromides in true epilepsy, and agrees with Biswanger that the evil results of their continued administration is greatly exaggerated both by the profession and by the lay public. One of the reasons of their failure in private practice he states to be this fear, the want of realisation of the continued and continuous effect of the drug, as well as a want of patience and perseverance on the part of patients and their relatives. Beyond the passing and occasional first symptoms of bromism, he has never in his experience seen any bad results when the drug was administered in doses of from 3 to 4 grms. per day to children, and from 5 to 6 grms. per day to adults. Except occasionally, when ordinary doses lost their influence, he has never prescribed the drug in larger quantity.

He next proceeds to deal with the very important question of mistakes in diagnosis, whereby other affections are confounded with genuine epilepsy.

The first group of cases in which errors in diagnosis are apt to be made, are met with chiefly in private practice and in young persons, although not a few cases have been observed among adults. The relatives are always sure that epilepsy exists, and many of the symptoms are identical with those of true epilepsy. The seizures occur almost always in the day time, and the tongue, sometimes the lips, are bitten. Sometimes as many as four to five attacks occur in a day. The seizures are often due to physical disturbances, *e.g.* constipation, and often to occurrences in the surroundings, such as family quarrels, whippings, etc. After the attacks there is usually drowsiness, irritability, or paræsthesia; such objective symptoms as pupillary anomalies or heightened patellar reflex may also be observed. When in such cases bromide is prescribed in doses according to the age of the patient, the only result is an increase in the severity and frequency of the fits. If the doses are increased, mental apathy, obtuseness, and urinary troubles and acne result. The writer looks upon such cases as hysterical manifestations. A complete change in their surroundings, such as isolating them or placing them in an asylum, lessens the frequency of the seizures or often stops them altogether. The sudden cessation of the bromides is followed by no bad effects. In some cases of this kind he is of opinion that the exhibition of the bromides is useful for purposes of differential diagnosis. Next he discusses a group of cases, almost wholly confined to children, where organic changes in the brain are either congenital or acquired at a very early age. Their only point of resemblance to true epilepsy is in the character of the convulsions. When bromides are given to such cases, the results are inconstant. Any improvement is temporary, and at intervals the fits return in spite of bigger doses. In such cases a regular bromide course is not justified. Fürstner next proceeds to discuss what is known as "epilepsia tarda," and will only admit into the group those cases in which there is no gross brain lesion present. In some cases of epilepsia tarda the bromide treatment successfully removed the fits; in other cases the results were less satisfactory, and after apparent recovery the attacks returned. In the last group he is of opinion that organic brain lesions were present, either congenital or of early occurrence (infantile paralysis), or, more probably still, that the cerebral arteries were atheromatous.

Before pronouncing any opinion based on statistics, as to the value of bromides in true epilepsy, it is necessary and desirable to have more knowledge regarding the convulsions and fits of infancy. Whether these stand in any relation to epilepsy or not, they certainly tend to create a predisposition towards the occurrence of that disease in later life. Out of 141 cases where epilepsy occurred prior to the 18th year, the writer found that convulsions had occurred in childhood in ninety-two cases; and where epilepsy first appeared in fifty-two cases, at the age of 20 to 30 years, convulsions in childhood were ascertained in nineteen of them.

Fits in children should be systematically treated with bromides, and the treatment should be continued long after the cessation of the fits. The writer had his best results where the treatment begun in childhood was continued over the age of puberty.

DERMATOLOGY.

UNDER THE CHARGE OF

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Acne Necrotica.

Sabouraud (*Ann. de dermat. et syph.*, Paris, Oct. 1899) has subjected to a careful study this singular skin affection, designated in France acne pilaris by Bazin, but better known in this country by its German appellation of acne varioliformis. The disease appears never to occur save as a secondary affection, and on a skin previously attacked by the micro-bacillus of seborrhœa. Its peculiar symptoms, its elementary lesion, its constant regional localisation, its chronic evolution and tendency to recur, finally the characters of its cicatrix, impart a well-marked individuality. The elements of the eruption are uniform, so that, watched from their appearance to their termination, we have the whole complaint. The primary lesion is a vesicle which forms like a small cushion round a hair follicle, distinguished from others by a brown point, Since this remains immovable, the vesicle is umbilicated from the first. In two or three days it has reached its full size, about 3 mm. in diameter, its contents are opaque, and it presents a narrow inflammatory areola which soon fades. In course of some days, without rupturing, it becomes a hard crust, embedded in the skin like the scutulum of favus. This crust, at first yellowish green, becomes brown with age. If turned out, there is revealed beneath a cup-shaped, greyish depression. When it falls spontaneously, there is left a red excavation, dry, white, very like that following variola. Sometimes, though rarely, a second vesicle forms round the primary one, or two neighbouring ones unite. On the temples and in the young, the eruption may, from scratching, assume an impetiginous aspect. It does not occur before puberty. For its production, like all acnes, it requires a soil previously seborrhœic; hence its situations are on the nose, temples, forehead, the interscapular and intermammary regions. The scalp constitutes an exception, for there, while seborrhœa specially localises itself on the vertex, acne necrotica affects more frequently the temples. It proceeds by successive outbreaks, and these may be numerous. The subjective symptoms are limited to tension and pruritus, scratching tending to extend the disease. It is seen particularly in adult and mature age, even in the old, but then less severe. The scars are deeper than those of variola, and may be confluent and extremely disfiguring. Turning to the histology, not only must seborrhœa precede the evolution of acne necrotica, but the individual follicle round which it develops must have been infected, its upper third being occupied by a cocoon of corneous layers, containing the specific micro-bacillus of seborrhœa. This gives rise to a focus of least resistance, in which the new pathogenic agent may grow. This consists of cocci, having characters identical with staphylococci. These form a circumfollicular ring, followed by an abundant afflux of leucocytes, which give rise to an elevation round the follicle. These are succeeded by an infiltration of leucocytes invading the epidermis and corium. As a result of this the connective tissue dies and becomes a sequestrum or crust. Beneath the crust reparation takes the form of a film of epidermis, gradually assuming a greater thickness. All the features described can be studied in the crust. The coccus on cultivation is a yellow staphylococcus, not the morococcus of Unna, and when inoculated it produces acne necrotica in a mild form. In treatment it is necessary to attack not so much the lesion as the region, since the disease is widely distributed. We must use antiseptics, but unfortunately most are harmful to the epidermic cells more than to the microbian ones. Among those least hurtful to the skin, many are scarcely antiseptic. The first treatment is purely one of cleansing. Local massage, with a mild pomade like the following, will in ordinary cases blanch a necrotic acne in a few days. ℞ Calomel, 0·30 cgrm.; oxide of zinc, 1 grm.; vaseline, 20 grms. In older cases a more active pomade should be used from the beginning. ℞ Sulphur. ppt. calomel, aa 0·30 cgrm.; resorcin, 1 grm.; vaseline, 20 grms. The immediate effects are excellent, but they are not lasting. Only clinical experience can give an idea how strong the tendency to recur is. When the first medication has produced its result, one ought as quickly as possible to treat the subjacent seborrhœa. On the trunk it is necessary to provoke as rapidly as may be, and several times in succession, the integral renewal of the horny epidermis, by the application of strong ointments. Thus—℞ Resorcin. acid. salicylic., aa 5 grms.; vaseline, 20 grms., to which may be added a few drops of tincture of iodine, to augment its power of causing mortification of the epidermis, obtains excellent results on the skins of robust seborrhœics. On the head reducing agents of the type of pyrogallic acid suit better. It may be used alone, or combined with sulphur and tar. After three months of such treatment, daily frictions, with weak alcoholic solutions of iodine or corrosive, should be employed for a like time. But it is uncertain if even by these measures the seborrhœa can be definitely cured.

ON THE OCCURRENCE OF SEBACEOUS GLANDS IN THE MUCOUS MEMBRANE OF THE ORAL CAVITY.

FORDYCE in 1896 (*Journ. Cutan. and Genito-Urin. Dis.*, N. Y.) described an affection of the vermilion border of the lips, which caused a fading of the colour, but, by putting the tissues on the stretch, small, irregular, closely aggregated milium-like bodies of a light yellow hue, just beneath the surface epithelium, became visible, and to the coalescence of these the blanching was due. An examination of the mucous membrane of the mouth revealed a similar condition, extending along the line of the closed teeth, from the angle of the mouth backwards to a point opposite the last molar tooth. The lesions within the oral cavity were lighter in colour than those on the lips, and in places somewhat elevated and papillomatous in character. His suggestion, based on microscopical investigation, was that there was a cell change allied to that which takes place in the granular layer of the epidermis, leading to an imperfect cornification of the mucous membrane. Audry (*Monatsh. f. prakt. Dermat.*, Hamburg, 1st Aug. 1899) was himself the subject of this anomaly in a mild form, and found it accompanied by no subjective sensations. He had observed it pretty often in adults, rarely in the elderly, seldom in women, and only exceptionally in children. From sections he came to the conclusion that each granule corresponded to a sebaceous gland or an acinus of one. Some of these were subepi- others intra-epithelial. All opened on the surface by means of a more or less distinct passage. There were, so far as he could discover, no hairs, though there were appearances suggestive of abortive ones. As to the causation, he formulated the hypothesis that such were misplaced, invaginated germs, originating in fœtal life, and taking further development at puberty with the sexual hair. They are, in fact, the rudiments of hairs in the mucous membrane of the cheeks or lips. Delbanco (*ibid.*, 15th Oct. 1899) has further added to our knowledge of this condition. He has pointed out that some at least of those who exhibited it had suffered from syphilis, and had been salivated more or less severely. Why the same development does not take place in smokers with decayed teeth, and consequent salivation, he cannot explain. At the same time he regards the appearances to be due to an increased development of misplaced sebaceous glands, in consequence of inflammatory irritation. While Audry found no traces of inflammation, Delbanco did. A point yet waiting determination is whether in these cases there is a new formation of glands from the prickle layer, or merely a further development of previously existent germs. Montgomery and Hay (*Dermat. Ztschr.*, Berlin, Dec. 1899) note that the contrast between the red background of mucous membrane and the yellow spots imparts the papular-like aspect, since these are always soft, and are not recognisable as papules to the examining finger. Neither degeneration nor inflammatory processes seem to occur in them. In many examples they remain both in number and in size stationary, in others their numbers so increase as to occasion a discoloration and disfigurement of the lips. In one instance they were seen in an infant. Sections made from two patients, both of whom had suffered from syphilis, though this they regard as an accident, showed the structure of a sebaceous gland. The transition of the epithelium of the mucous membrane into the gland opening was observed. The lumen of the duct was filled with an amorphous substance and broken up-epithelial cells. The yellow colour is due to the fatty contents shining through, owing to their superficial position.

TWO EPIDEMICS OF ALOPECIA AREATA IN AN ASYLUM FOR GIRLS.

BOWEN (*Journ. Cutan. and Genito-Urin. Dis.*, N. Y., Sept. 1899) records the following. A girl, æt. 11, who had lived for eight years in an asylum for girls, was discovered to have several spots of baldness, differing in appearance in no way from ordinary alopecia areata. A few weeks later another girl in the asylum was found to be similarly affected. Four months subsequently it was found that sixty-three of the sixty-nine children in the institution were affected to a greater or less extent. As a whole, the epidemic was characterised by the small size and irregular, angular, and linear form of the bald areas; although in a small number of instances the larger areas usually seen in alopecia areata were present. At the end of two months the areas began to fill in, and at the end of six months only a few patches could be found. The girl in whom the affection was first observed left the institution, and was away three years. It is not definitely known whether the hair had grown over all the bald areas or not, but it is not unlikely that some small areas had persisted. Six years after the first epidemic, she re-entered the institution, at the age of 17. There had been no cases of scalp affection in the asylum since the previous epidemic. A month or six weeks after her entrance, spots of apparent alopecia areata were discovered on the head of one of the children, and four or five months after her return twenty-six of the forty-five children were found to have spots of baldness of the same dotted and angular character as those of the first epidemic, areas in no way differing from those of alopecia areata as commonly seen. Repeated examinations were made of the hair, taken from a great many of the cases, but no trace of micro-organisms could be detected under various methods of staining. Sections of a portion of skin showed atrophy and degenerative changes in the sebaceous glands and hair follicles. There was slight enlargement of the superficial vessels, and a few leucocytes in their vicinity, mostly of the lymphoid variety, with numerous mast cells. In the discussion on the paper, while it was pretty generally admitted that the cases pointed to contagion, one speaker suggested the possibility of a psychical element, that under the circumstances hysteria and imitation should be borne in mind. Robinson (*ibid.*, Nov. 1899) had observed the almost invariable presence of the *Staphylococcus albus*, in spite of a very thorough disinfection of the diseased area, but had not been able to cultivate any special undescribed micro-organism in alopecia areata.

THE TREATMENT OF ECZEMA.

ON this Simon in the Ingleby Lecture (*Birm. Med. Rev.*, Jan. and Feb. 1900) makes some very practical remarks. He admits that we do not yet know whether eczema is an outward manifestation of a dyscrasia, or an accidental disturbance of the skin itself. Yesterday we believed in blood dyscrasia, to-day in bacillary infection, to-morrow, who can tell? But it will be an evil day for medicine when we cease to study the individual patient, and are content to believe that we have solved the mystery of disease, because in most or all of our cases we find a specific bacillus. As succeeding generations have negatived the ideas of their predecessors, so may the parasitic theory in turn be forgotten. He believes strongly that eczema may occur without local irritation, and that, whether we can put our finger on it or not, there is always some constitutional condition which underlies the disease, fitting the soil for the growth of bacilli. Even in trade eruptions only a proportion suffer, though all are exposed. The constitutional causes are probably multiple, and thus need close study. The frequency of eczema and its amenability to treatment in some cases is shown by the multiplicity of patent remedies advertised for its cure, for no patent medicine could hold its own for a day, if a certain proportion of cases could not be easily cured. In acute cases we must discard all remedies which act by increasing the peripheral circulation; the drug he regards of most value being antimony, to which he adds small doses of sulphocarbolate of soda. Ichthyol is also valuable, but less so. The diet should be very simple, mainly milk, bread, and vegetables; alcohol only if patient old or very feeble. To induce sleep and procure rest from scratching, opium should be given, or, if contra-indicated, bromide. Chronicity in eczema means that the increased distension of the superficial blood vessels has resulted in an outpouring of the products of inflammation with thickening of the cutis. The sweat function is abolished, and this is the main cause of the intolerable itching. In chronic eczema with thickening, pilocarpine subcutaneously and arsenic are the most important remedies. As regards the local management, all crusts should be removed by saturating the part with sweet oil, or enveloping with indiarubber. Whatever drug is used, it is well to add salicylic acid, as this has a marked keratolytic action, and by the destruction of the superficial cuticle entry is facilitated. A useful prescription is—℞ Liq. carbonis deterg., ½ drm.; acidi salicylici, 20 grs.; zinci oxidi, 1 drm.; lanolini ad 1 oz.—*M.* In chronic eczema, though washing should, as a rule, be avoided, a bran bath at 95° to 98° allays itching. In subacute conditions he finds the following more serviceable than any other:—℞ Liq. plumbi subacetat., 2 oz.; acidi salicylici, 20 grs.; cream ad Oj.—*M.*

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Geographic Tongue.

Jacobi, writing on this subject, describes the geographic, or so-called psoriasis of the tongue, as being interspersed with small or large red spots, raised above the level, and exhibiting considerably enlarged papillæ. These spots are surrounded by more or less regular branching and interlacing lines, that are raised, and consist of the swollen papillæ filiformes and their epithelia. He regards it as an innocent condition, having absolutely no connection with syphilis, and as being often congenital and persistent. The only harm that can result from it is the possibility of microbic invasion through a surface not in an absolutely normal condition. In many cases it stubbornly resists treatment, and even where it shows a disposition to yield, the cure is always a difficult one, and takes a long time. Probably the best applications are washes of borax and chlorate of potassium, chiefly indicated, however, as preventing complications arising. He does not consider the name psoriasis of the tongue as at all appropriate. That peculiar affection of the skin was probably never intended to be applied to the mucous membrane, nor does Unna's name, "aerated exfoliation," cover the case entirely, for it is less the exfoliation of the surface than the hypertrophy and the accummulation of epithelium which is characteristic.—*Arch. Pediat.*, N. Y., Jan. 1900.

VALUE OF KERNIG'S SIGN IN THE DIAGNOSIS OF MENINGITIS.

THE importance of this diagnostic sign, which was first described by Kernig of St. Petersburg in 1882, has latterly been attracting a considerable amount of attention in the American and Continental medical journals. Netter (*Bull. Soc. méd. d. hôp. de Par.*, 22nd July 1898) states that in fifty-one cases this sign was absent only in six. He believes that when it is present the diagnosis of meningitis is confirmed, and a latent meningitis is suggested when it is the only symptom present. He failed to observe this sign during the course of other diseases, often difficult to distinguish from meningitis in their early stages, such as typhoid fever, pneumonia, acute articular rheumatism, etc.; and he considers that, if it were always looked for, the diagnosis of doubtful cases of meningitis would be greatly facilitated. The sign is obtained by placing the child on his back, and taking care to see that the legs are fully extended on the thighs. If now we gradually raise the child to a sitting position, we will find that flexure of the legs has taken place at the knee-joints, and that by no effort which we can make can the legs be extended until we once more lay the child on his back. The explanation of this flexure is, that owing to the inflammation of the spinal membranes the roots of the nerves become irritable, and when the patient assumes the sitting position, with flexure of the thighs on the pelvis, stretching and elongation of the nerve roots occurs, and their irritability is increased. All varieties of meningitis are said to produce this sign, including tubercular meningitis, secondary forms, and cerebro-spinal meningitis. In a clear case of typhoid fever, which ultimately died of perforation, Kernig's sign was obtained, and at the post-mortem, in addition to the intestinal signs of typhoid fever, a meningitis was discovered, due to *Staphylococcus aureus*. Osler, in an address on cerebro-spinal meningitis, reported in *Canad. Pract.*, Toronto, August 1899, found this sign present in all of the twenty-one cases which he examined in a recent epidemic at Baltimore. He drew attention to the well-known fact that in all protracted cases of meningitis the patient lies with the thighs flexed on the pelvis, and the legs on the thighs. When the patient is unable to sit up, the sign can be equally well elicited by flexing the thigh on the abdomen and then attempting to extend the leg. If meningitis is present, this cannot be done. He considers its presence no indication of the severity of the spinal lesion. When the patient lies on the back, with the thighs extended, extension of the knee is not sufficient to produce reflex contraction of the flexors, but it does so when he assumes the sitting posture.

IMPORTANCE OF PROLONGED REST AFTER ACUTE CARDIAC INFLAMMATIONS IN CHILDREN.

HOLT considers that there are three reasons why cardiac inflammations are likely to be especially serious in young children—(1) Because of the frequency with which both endocardium and pericardium are involved; (2) on account of the great tendency to acute dilatation; and (3) because of the liability of the attacks to be complicated with pneumonia. The cardiac muscle in young children has not the same resistance which it attains in adult life, and, as a consequence, under the strain of inflammation, dilatation comes on very readily and progresses rapidly. The danger of dilatation is increased in cases complicated with pericarditis. It is largely due to dilatation that so many cases succumb during the acute attack, and it is usually owing to this cause that cardiac failure with dropsy so frequently follows within a few months of the primary attack. The writer is of opinion that if we would minimise the injurious effects of endo- and pericarditis, we must secure to those patients as nearly absolute rest as possible, and not simply for a period of two or three weeks after the acute symptoms have subsided, but for as many months. With children it becomes an absolute impossibility to control or regulate the amount of exertion when once they are allowed out of bed. With them, therefore, if rest is to be secured at all, it can be accomplished only by strict confinement to bed and in a recumbent position. This must be continued long enough for the heart to regain its tone, and for a readjustment of the circulation to take place.—*Arch. Pediat.*, N. Y., December 1899.

A CASE OF ALCOHOLIC CIRRHOSIS IN A BABY.

THIS interesting case, which occurred in a girl æt. 16 months old, was reported to the New York Medical Association by Dr. Abrahams. Since the age of 14 months there had been loss of appetite, increasing pallor of the face, constipation, and increased size of the abdomen. There had been no hæmorrhages from the stomach or bowel, and no jaundice. The abdominal distension was extreme, the circumference at the umbilicus being 26 in. During the ascites neither the spleen nor the liver could be defined. There was no effusion except in the abdominal cavity. The diagnosis of cirrhosis of the liver had been made by exclusion. Syphilis had been excluded by careful inquiry and examination. An ascites from tuberculosis would have developed more slowly than in this case. In the absence of œdema of the lower extremities, and marked urinary signs and symptoms, interstitial nephritis had been excluded. It had been finally ascertained that since very early infancy the baby had been allowed to imbibe beer quite freely. Paracentesis was performed, the amount of liquid allowed was restricted, the administration of beer forbidden, and the bowels were kept relaxed. After the tapping, the liver was found to be enormously enlarged, extending down to the iliac spine, with a hard, firm, smooth surface. No further tapping was required, and under treatment considerable improvement had occurred.—*Med. Rec.*, N. Y., 6th January 1900.

TETANY AND AUTO-INTOXICATION IN CHILDREN.

KASSOWITZ considers that evidence is still wanting to support the theory of the production of tetany by the absorption of toxic material from the intestines. Diarrhœa, gastro-intestinal catarrh of all descriptions, and other diseases owing their origin to intestinal toxæmia, are particularly common during the summer months, and, in his experience, cases of tetany are peculiarly infrequent at this period of the year. The great majority of cases of tetany occur during the cold months of the year, gradually increasing in number and severity until the month of April, when the maximum is reached. He believes that a very close relationship exists between rickets and tetany, and that a genuine case of tetany is seldom met with in a child who is not suffering from some of the manifestations of rickets; and that, furthermore, the periods of the year furnishing the hospital waiting-rooms with most cases of rickets are productive also of the greatest number of cases of tetany. In rickets we find a hyperæmia, with dilatation of the blood vessels of the growing portions of the bones in the skull, and he believes that the tetany is due to cortical irritation, arising from the proximity of the brain cortex to the local inflammatory process in the bones.—*Arch. f. Kinderh.*, Stuttgart, Bd. xxv. Hefte 3, 4.

REPORTS OF THE MEDICAL SOCIETIES.

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Glasgow Pathological and Clinical Society.—*12th February* 1900.—Dr. **Thomas Barr** delivered his presidential address, "Recent Developments of Intracranial Surgery in relation to Purulent Diseases of the Ear (Otocraniology)," accompanied by a demonstration of cases. Dr. Barr said that it was interesting to consider this subject in the building where the meeting was held, from the fact that it was in the Ear Hospital that the recent striking development of intracranial surgery had originated, so far as Glasgow was concerned. The general surgeon had come to the aid of the otologist, and had utilised the special knowledge of the latter. Up till 1886 the treatment of intracranial abscesses had been a blank. The interest in the condition had been one of diagnosis, followed by post-mortem. In 1886, however, a new era had commenced, and, on the 22nd January 1887, Dr. Macewen evacuated an abscess in the temporo-sphenoidal lobe of a boy, æt. 10. The patient had suffered for twelve months from a purulent discharge from the right ear. For one month he had presented the symptoms of brain abscess, namely, vomiting, stupor, paralysis of the third nerve, with paresis of opposite cheek, emaciation, slow, feeble, and intermittent pulse, and low temperature. The case was presented to the meeting. He was now a strong young fellow, æt. 23. He has never had any headache or giddiness, and up till a year ago played football. He can hear a whisper close to his ear, and a watch at a distance of 1 in. There is still a slight otorrhœa, but not such as to make another operation necessary. There is still felt some slight pulsation at the trephine opening. Within one year from the date of the operation in 1886, cerebral abscess was localised and operated on. Dr. Barr showed also the following cases:—(*a*) Cerebellar abscess in a case of otorrhœa of ten years' duration. This case was operated on in May 1898, and he now goes about the country as a packman, traversing fifteen miles a day with his pack. His only trouble is that he sometimes staggers in the dark, if tired. (*b*) Extradural abscess on posterior surface of the petrous bone; operated on in August 1897. The petrous bone was carious in greater part, and was largely gouged away. *Lateral sinus.*—This structure was first attacked by Arbuthnot Lane in 1888. Since then operations on the sinus for thrombosis have been very frequent. In this connection Dr. Barr showed a case of purulent thrombosis of the left lateral sinus, pulmonary abscess, and gangrene. Ligation of internal jugular had been performed, followed by opening and cleaning out of the sinus from the torcular to the jugular foramen. The following rules were useful to bear in mind:—(1) In presence of symptoms of intracranial mischief, examine the ears for evidences of past or present purulent disease. Do not take patient's statements for facts. (2) If rigors have been present for some time, along with general infection, ligate the jugular and open the lateral sinus. (3) The fallacy of a normal or low temperature may cause fatal delay. (4) Intermissions are sometimes observed in these cases; and apparent recovery may be followed by death. (5) The absence of pain, during whole or part of the course of the disease, may deceive the observer. (6) One symptom may be exaggerated sometimes—vertigo. This is very commonly a symptom of slight ear disease. If other symptoms are absent, vertigo is of little value. (7) If the case is acute, complications are rare and less grave. There is tendency to purulent softening of thrombi. But it is difficult to determine a purely acute case, acute symptoms being often grafted on a chronic case. This development of otocraniology has helped to raise otology in the eyes of the profession, as well as to benefit the patients, but one must remember to avoid the danger of over-doing operative treatment. There were many cases of otorrhœa which would get better under simple measures.

FORFARSHIRE MEDICAL ASSOCIATION, University College, Dundee, *Wednesday, 7th March* 1900.—Dr. TEMPLEMAN, Vice-President, in the chair.—Mr. GREIG showed—(1) A man, after excision of the left upper jaw for sarcoma. (2) A patient with coxa vara, pointing out the altered movements of the hip-joint, and the attitude in standing and lying. (3) Several specimens—(*a*) The upper jaw with tumour attached, removed from the former patient; (*b*) a femur removed by amputation for acute osteomyelitis; (*c*) two specimens with loose bodies in the tunica vaginalis testis.—Professor C. R. MARSHALL spoke on the nitrites and allied substances. He explained how it could be shown by experiment that these substances only acted on the blood vessels and not on the heart. He pointed out the various steps that had been taken in order to find a substance with a similar action to nitroglycerine or glycerol nitrate, but which had a more prolonged or lasting action. The toxic effects of these substances was then shown to be due to their power of forming methæmoglobin in the blood, and that the sodium nitrate was in this more rapid than nitroglycerine.—Dr. GEORGE WHYTE gave an account of a case of corrosive sublimate poisoning which had resulted in recovery, partly due to vomiting being induced early, and to its solubility in alcohol. The quantity taken was equal to 9·6 grs. The patient resumed his occupation on the fifth day after taking the poison.—Professor STALKER gave notes of a case of subacute endocarditis which he had had under his care. The case showed some difficulty in the diagnosis.—Professor L. R. SUTHERLAND showed the heart from this case, which had vegetations on the mitral cusps. Several of the chordæ tendineæ had given way, causing the valve to flap during the heart's action, and infect the endocardium in the auricle.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY, *7th March* 1900.—Mr. A. G. MILLER, President, in the chair.—Professor D. J. HAMILTON read a paper on "The Influence of Heredity on Disease." The transmission of contagious disease, *e.g.* syphilis, is not heredity. The question he wished to discuss was, Can external influences so affect the organism that it is changed, or transmits this change, to its offspring? Hereditary tendencies are due to variations in the germ plasm. Tubercular disease is not hereditary, and children are not born tubercular. A particular predisposition is inherited, and the vulnerability to tubercle, which some individuals show, is due to the epithelial coverings of the body being too little resistant and too prone to inflame, and this epithelium, in a catarrhal state, is very readily inoculated. This vulnerability of the epithelium is handed down. Tubercular features, the gouty and other diatheses, are probably due to a variation introduced in remote times perhaps, and only appearing when external circumstances are favourable. Polydactylism is said to be a reversion to some far-off ancestor. He was of opinion that the various hereditary tendencies have arisen as variations in the germ plasm, that these variations date far back, and that external agencies only act in bringing them to light. He did not believe that there is such a thing as telegony, or that the effect of external impressions can be transmitted. An interesting discussion followed.

Glasgow Medico-Chirurgical Society, 16*th March* 1900.—Dr. M'Call Anderson showed—(*a*) A case of hemiplegia. The patient, a riveter, æt. 45, was admitted with complete paralysis of face, arm, and leg on the left side. The heart and arteries were healthy, and there was no kidney disease. Potassium iodide was given in 10-gr. doses thrice daily, gradually increased to 2 drms. thrice daily. The patient made a complete recovery. Dr. Anderson thought that the lesion was probably a gumma pressing on one of the large cerebral arteries. (*b*) A case of chorea, with special reference to treatment. The patient, a girl æt. 9, had suffered from chorea for fifteen months. The symptoms were very severe. Antipyrin was given in small doses at first, but was gradually increased till 135 grs. were given daily. The patient, although not completely recovered, was much improved.—Dr. Walker Downie and Dr. Kennedy showed—(*a*) A patient, a woman æt. 30, suffering from stricture of the œsophagus, on whom gastrostomy (Frank's operation) was performed nine months ago. Symptoms first began about Christmas 1897, with difficulty in swallowing solids, followed in September 1898 with difficulty in swallowing liquids. There was, at this time, paralysis of the left recurrent laryngeal nerve. The passage of a bougie discovered a stricture of the œsophagus, 7¼ in. from the upper incisor teeth, *i.e.* about the second tracheal cartilage. Relief was obtained by the passage of bougies and the administration of potassium iodide. The patient was then lost sight of, but returned in June 1899, by which time she had lost 12 lb. in weight. As it was then found impossible to pass bougies, gastrostomy (Frank's operation) was performed. The patient made a good recovery. There is a tendency to ventral hernia of the stomach wall. Paralysis of both vocal cords is present, and produces great breathlessness on exertion. (*b*) Parts from a case of extensive primary tubercular ulceration of the œsophagus, in which gastrostomy (Witzel's operation) was performed. The patient was first seen on 30th November 1899, when she complained of gradually increasing pain and difficulty in swallowing. She had suffered from suppurating glands in the neck in childhood. Passage of a bougie disclosed a stricture of the œsophagus, 7 in. from the upper incisor teeth. There was swelling externally on the left side of the trachea. This, after increasing for a time, suddenly disappeared. On 20th January 1900, gastrostomy (Witzel's operation) was performed. Pain in the throat disappeared after forty-eight hours. Pus, containing tubercular bacilli, appeared in the urine. Later, the swelling on the left side of the neck reappeared. An opening was made into it, and a large quantity of foul-smelling pus evacuated; a communication was found between the abscess cavity and the trachea. The lungs eventually became involved, and the patient died on 3rd March.—Dr. **James W. Allan** read a paper on "Lectureships on Trade Diseases," in which he advocated a course of instruction in trade diseases.

ANALYTICAL REPORTS.

Table Jellies.

(S. Chivers & Sons, Cambridge.)

The proof of the pudding is in the eating thereof; so the testing of table jellies is best done by tasting them. Chivers' Jellies are supplied in the form of concentrated squares, the solution of which, in a pint of warm water for each square, affords a perfect form of table jelly on cooling—clear, of proper and pleasing consistency, and delicately flavoured. The samples sent us were flavoured with orange, lemon, and raspberry, and possess the great merit of not being overloaded with the essences of the fruit. We especially noted this in regard to the Orange Jelly, which tasted exactly as if a squeeze of fresh orange juice had been added (indeed, one almost would have wished that the squeeze had been longer, or repeated), not as if an extract of orange peel, sweet and bitter, often it seems chiefly of the latter, had been used—a not uncommon supposition upon partaking of such delicacies. These concentrated means of producing appetising, clear fruit-flavoured jellies with little trouble, afford us opportunities of tempting poor or capricious appetites to make a beginning towards health, or of helping to support the weak until able to deal with stronger foods.

Light Wines, Red and White.

(Innes, Smith, & Co., Birmingham.)

We have been favoured with samples of light wines by the firm of Innes, Smith, & Co., of Birmingham, wines such as are suited to serve useful ends in connection with professional advice upon what may be taken with advantage by invalids and convalescents. The samples comprise a fine champagne, a Portuguese red wine, two of French red wines, Australian, Hungarian, and a white Moselle. All are sound wines of a light character, the Portuguese sample especially appealing to our sense of fitness. The Australian red wine, although apparently of as sound a nature as the others, possesses that faint flavour pathognomonic of so many of these antipodal brands, which we confess requires cultivation to appreciate and enjoy. The other wines are of excellent quality, and, being of a light character, should become popular as beverages less likely to disturb the digestive powers than the stronger forms from the same localities.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING FEBRUARY 24, 1900; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	37°·52	[1] 36° [2] 64°	171° 349°	2·4	5·0	59	91	2°·9
Observed	31°·77	[1] 0° [2] 24°	286° 400°	2·7	6·2	67	104	2°·37
Difference	−5°·75	[1] −36° [2] −40°	+115° + 51°	+0·3	+1·2	+8	+13	−0°·53

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING FEBRUARY, AND SINCE JANUARY 1, 1900. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 1155 [2] 2414	200 209	212 427	36·8 37·0	100 217	17·4 18·7	265 563	45·6 48·5	125 265	21·7 22·9
Actual Deaths and Rate per 10,000	[1] 1433 [2] 2832	247·9 244·9	229 445	39·6 38·54	138 281	23·8 24·2	385 735	66·6 63·3	137 288	23·7 24·76
Difference from Mean	[1] +278 [2] +418	+47·9 +35·9	+17 +19	+2·8 +1·54	+38 +64	+6·4 +5·5	+120 +172	+21·0 +14·8	+12 +23	+2·0 +1·86

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 68 [2] 142	11·8 12·5	30 56	5·2 4·86	90 192	15·7 16·6	110 217	19·2 18·7	50 100	8·6 8·6
Actual Deaths and Rate per 10,000	[1] 73 [2] 168	12·6 14·7	34 74	5·8 6·40	141 287	24·4 24·68	117 205	20·2 17·67	51 105	8·8 9·0
Difference from Mean	[1] + 5 [2] +26	+0·8 +2·2	+ 4 +18	+0·6 +1·54	+51 +95	+8·7 +8·08	+7 −12	+1·0 −1·03	+1 +5	+0·2 +0·4

* NOTE.—The figures [1] denotes the data for February, [2] for year to date.

The four weeks ending 24th February were much colder than usual, 5°·75 F. below the normal mean temperature of 37°·52 for the period, with an entire absence of any warmth above 42°, and almost double the average number of day degrees below that point. The rainfall and sunshine were slightly in excess, the variability considerably below the normal values. For the first eight weeks of the year there is a deficit in warmth, and an increase in cold, rainfall, and sunshine.

Accompanying the severe cold we find a very great increase in mortality, 1433 deaths in place of 1155, an increase equal to 24 per cent. of the latter figure. Among the various systems and diseases the respiratory deaths are 45·2 per cent., the circulatory 38 per cent., and deaths from pneumonia 56·6 per cent. above the average. The deaths from pneumonia alone constitute 9·8 per cent. of the total deaths. Influenza is recorded as causing 139 deaths, or 9·7 per cent. of the total.

For January and February the total mortality is 17·2 per cent. over the expected figure; the deaths from pneumonia reaching as high as 49·4 per cent., and those from all respiratory causes as 30·5 per cent. above the average. The deaths from influenza for the first two months number 224, or 7·9 per cent. of the total deaths. Only deaths from phthisis show a decrease. The combined influence of the cold weather and of influenza is shown by the high proportion of deaths from pneumonia among the total respiratory mortality. Normally forming 34 per cent., during January and February, deaths from pneumonia are equal to 39 per cent. of the respiratory total.

February, therefore, colder than for many years past, save in 1895, shows a high mortality, remarkably so under respiratory and pneumonic diseases; the same applying to the year to date, although the weather of January was in marked contrast to that of the month following it.

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ORIGINAL COMMUNICATIONS.

POINTS OF PRACTICAL INTEREST IN SURGICAL GYNÆCOLOGY. — I. SOME POINTS IN GYNÆCOLOGICAL ASEPSIS.

By H. MACNAUGHTON JONES, M.D., M.Ch., M.A.O. (Hon. Causâ), F.R.C.S. Ed. & I., *formerly Professor and Examiner in Obstetrics and Gynæcology, Queen's College, Cork, and Royal University of Ireland.*

GEORGE ELIOT remarks that "very little achievement is required in order to pity another man's shortcomings." I trust that nothing in the communications I am about to make in this Journal will be regarded in the light of a criticism on any special operative methods, whether in the technique of an operation or the manner of its performance, but rather as a general contribution, from personal experience, of the execution of those details that I have myself practised, or have seen others carry out, in conducting to a successful issue any given operative step.

The last few years have seen the emergence from a comparative state of chaotic confusion, in which those practising in it were then struggling, of this most important department of surgery which we call gynæcology. The surgery of the pelvic organs of women takes rank with that of the abdominal viscera and the brain; progress in all three has completely revolutionised the treatment of disorders of the generative organs of women, those of the various abdominal viscera, and the many obscure conditions of the nervous system, cerebral and spinal, which modern neurology has elucidated. Gynæcology, however, as now practised, covers in its operations a much larger field than would be included by the treatment of the pelvic organs alone. This widening of its sphere resulted as a natural consequence of the many abdominal complications met with in connection with pelvic diseases. Operations for the latter revealed errors in diagnosis which compelled the gynæcologist to deal with unforeseen conditions and complications that practically involved the entire surgery of the abdomen. Tumours of the spleen, morbid states, growths and displacements of the kidney, affections of the intestines complicating uterine tumours and adnexal diseases, or unavoidable accidents to the bowel arising in the course of an operation, all necessitated immediate action on the part of the surgeon when the abdominal cavity was opened. Thus the surgery of the spleen, the kidney, and the bowel, as well as that of the generative organs, the rectum, the ureters, and bladder, has of necessity to be included within the range of modern gynæcology. While, strictly speaking, this is true, it is of course obvious that the gynæcological surgeon is more occupied by and principally interested in morbid states of the uterus and adnexa, and the more commonly occurring complications arising out of involvement of the genito-urinary organs and rectum, that he meets with in operating for these. And, so far as operative procedures are concerned, I have here only to deal with these.

As in other branches of the surgical art, the gradual evolution of gynæcology, in its application to diseases of the sexual organs of women, rests on the triple basis of anæsthesia, asepsis, and hæmostasis. In our natural desire to record our most striking surgical successes, we are too often led by a rather selfish egoism to forget altogether, or at least to minimise, the extent to which we are indebted for our results to the skilful administration of an anæsthetic. A prolonged operation is frequently one in which there is considerable loss of blood, and as a consequence associated shock; yet it is often under these very conditions that we require the full anæsthetic effect, and while we demand absolute immobility of the patient, we trust entirely to the skill of the administrator, and trouble ourselves only with immediate regard to our own manipulations. In our anxiety for exactitude and celerity, we take no count of the judgment that determines the approach of shock, that is ever on the alert for the accidents of anæsthesia, and that forestalls these without any unnecessary fuss or distraction of our attention. Changes in the position of the patient, re-sterilisation of infected parts, as well as the hands of the operator and his assistants, are under anæsthesia easily effected. If we can thus complete the thorough sterilisation of the abdomen and vagina, immediately before operating, without distressing the patient, so can we finish the abdominal toilet, and carry out all its aseptic details, before she recovers consciousness. Also, as the success of an operation must depend in great measure upon our pre-knowledge of its nature and the probable steps that the peculiarities of the case will demand, our decision must be based upon an accurate diagnosis, which latter can only be arrived at in many instances by the assistance of an anæsthetic.

Here, in passing, I may remark with regard to anæsthetics, that the great majority of my operations have been performed under the administration of nitrous oxide gas and ether, and this includes the majority of the most serious and the gravest cases. Oxygen has been added in some, and was first given for me, both as a prophylactic and restorative, in combination with ether, by Dudley Buxton. Occasionally chloroform has been chosen by the anæsthetist (and I never interfere with the administrator), but this has been for some special reason, such as lung complications, dislike on the part of the patient to ether, in some secondary operations, or where there was unpleasant abdominal movement under the ether. In short, gas and ether during an operation have given me complete satisfaction. Only on the rarest occasions has there been shock, sickness, respiratory or heart complications, and sickness is not a frequent after consequence. I have had no single case of post-operative insanity arising directly from an anæsthetic in abdominal or pelvic surgery, as I have had in ophthalmic. At Schauta's clinic in Vienna there is an admirable mixture used of chloroform 1 part, ether petrolei 1 part, and sulphuric ether 2 parts. This is given freely on the ordinary chloroform cap. The most convenient form of the latter that I know of is that of Czerny, used in Doyen's clinic (Fig. 1).

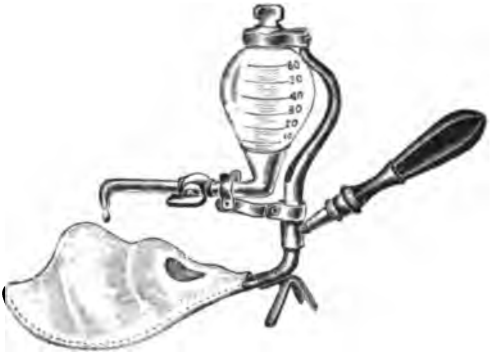

Fig. 1.—Chloroform inhaler of Czerny.

The second basis on which is founded our confidence in carrying out to a successful issue the simplest as well as the most difficult procedure in operative gynæcology, is thorough asepsis, previous to, during, and subsequent to, the operation. In gynæcology it is a platitude to assert that sepsis and hæmorrhage are the two consequences most dreaded by the surgeon and most fatal to the patient. The latter is not infrequently the cause of the former, therefore no conceivable precaution can be omitted, no matter how superfluous it may appear, or to what extent it may interfere with the seeming brilliancy of an operation, without the unhappy reflection on the part of the operator, that, had he not overlooked or neglected it, he might have prevented a tedious convalescence, the result of avoidable complications, or, sadder still, the death of the patient.

I have said "the seeming brilliancy of an operation." Doyen has written much upon operating quickly and well, but he also says that "when we lose a patient who has been operated upon, the most common cause of death is infection within the operative tract"; and again, "Carefully study the causes of death, and question your memory on the minutest details"; and that to an interference out of all proportion to the vital resistance of the patient, or to infection alone, or still more frequently to both causes combined, the fatal issue may often be ascribed. Operating "quickly" may be mistaken by some for that most mischievous of methods, operating in a hurry. A man may operate in haste, but he should never be in a hurry. Deliberation and completeness are our aims, and in no branch of surgery does this apply with greater truth than to that we are discussing. What strikes one most in watching the operations of such men as Martin, Olshausen, Schauta, Hartmann, Chrobak, Terrier, and other equally successful gynæcologists, is the apparent indifference to everything save completeness. The speed of execution demonstrated by a cinematographic pictorial representation is very interesting to look at, especially if the effectual hæmostasis be completed by a lever forceps of 2000 to 4000 kilogrammes pressure; but *it is not to be imitated in practice, save by a very favoured few.*

In no detail of an operation is this shown more than in the securing of perfect hæmostasis, not merely in the immediate arrest by forci-pressure or ligature of the smallest bleeding vessel, but in preventive hæmostasis by the ligaturing of any pouting mouth of a vessel in a pedicle or elsewhere; by the extreme care with which pedicles are ligatured and divided; by the drawing out of and the direct ligaturing of larger vessels, such as the uterine, and the refusal to cover over any surface or area in which there is still oozing, until this has been completely checked, and the surface comparatively dry. Some surgeons are apt to say that pressure and compress will check what they term "mere oozing," but every now and then we are unfortunately made to regret such trustfulness by an unpleasant and unexpected post-operative or secondary loss of blood. Bleeding interferes with asepsis by the retention of coagula which are apt to lead to suppuration, and by the necessity of reopening a wound, possibly under disadvantageous circumstances or surroundings, and in the absence of efficient sterilisation of appliances. Therefore it is better to prolong an operation a little, and thus secure certainty in hæmostasis, than for the sake of rapidity to close a wound with any feeling of insecurity in our minds. The days of suckers, clamps, and drainage tubes are practically over. Now and then, in exceptional cases, where forci-pressure or ligature fails, and where further delay may be serious, the placing on of a clamp and allowing it to remain is the only safeguard we can adopt. Otherwise, save as temporary aids during operation or occasionally as *dernier ressorts*, clamps no longer have a place in gynæcological technique. We thus get rid of another source of imperfect asepsis.

Complete cleansing of the entire operative tract, not only by hæmostasis, but, when necessary, by free sterilised saline irrigation, assisted by the careful removal of all fluid by sterilised sponges or gauze dabs, enables us to dispense with drainage in the great majority of cases, and when we do drain, the use of iodoform or other antiseptic gauze obviates the necessity for another potent source of failure in our aseptic technique, namely, the rubber or other form of drainage tube. Here, again, the prudent surgeon will sacrifice rapidity of operation to his satisfaction in providing preventive asepsis before proceeding to the abdominal or vaginal toilet. Thus, I think, most British surgeons will agree with me, that while "to operate quickly and well" is an object we should all aim at, there are many operative procedures in which celerity is dearly purchased at the expense of a risk entailed by want of deliberation and completeness in the details of the technique.

What, then, are the most important essentials in obtaining an ideal gynæcological asepsis? And first we have to answer the question, Is such an ideal perfection possible? I fear it is not, or at least that it can seldom be arrived at. This arises from a threefold cause. There is the impossibility, even by the most carefully carried out antisepsis, of entirely excluding germs from the skin wound and from the vagina, more particularly if in the latter there be any abraded surfaces, and that pathogenic organisms are present from uterine erosions and discharges, as well as in those septic states met with in many abdominal and pelvic operations from which infection may spread. Secondly, there are predisposing influences which may be entirely outside the power of any anticipatory or preventive measures to control. We have examples of this in the proneness to suppuration in certain individuals, due either to some condition of the tissues favourable to microbial growth, or to some special virulence and toxic properties in the pyogenic organisms present, or in the toxic matters to which they give rise. Here we have to take into account lowered vitality and defective powers of resistance on the part of the individual and the tissues, lessening any ordinary protective influence against septic invasion. Lastly, there are the many avenues through which infection may be admitted by even the most careful of nurses, assistants, and surgeons,—through some defect in the preliminary precautions, the surrounding atmosphere, the appliances in the operating-room; the instruments, some oversight or carelessness on the part of the nurse, surgeon, or assistants during the operation; defective sterilisation of water, or through any source of infection that may be overlooked in the final toilet and dressing of the womb.

In view of so many means of admission of infection, it is obvious how difficult is the attempt to obtain such an ideal asepsis as will secure for us the absence of septic germs from a wound. The recognition of this difficulty is the first step in the education of both surgeon and nurse, and if this be true, under ordinary circumstances, how much greater must be the care taken and the precautions adopted, when either nurse or surgeon is brought in contact with any septic case within a given time before the operation. This involves on the part of both not merely preparation immediately before the operation takes place, whether in an ordinary room or operating theatre, but exceptional precautions in private in regard to the cleansing of the arms and hands, as well as the use of fresh underclothing and linen on the day of an operation.

It is not here necessary to refer in detail to the most certain methods of sterilisation, either of the hands and arms, or of instruments and appliances. These are sufficiently well known, and operators vary as to the antiseptics that they employ, and the mode of sterilisation of ligatures, whether of catgut, kangaroo tendon, horse hair, silkworm gut, or silk. I shall, however, have a few words to say generally on the plan I adopt. I prefer, in the first place, to draw attention to a few blots in what is not uncommonly regarded as an antiseptic operation, and which are not infrequently ignored. I will, for the sake of brevity, enumerate them categorically—(1) Defective sterilisation of the rectum and vagina for at least forty-eight hours prior to operating. In the instance of the rectum this is avoided by the use of saline aperients, a dose of calomel and lavage with 1 in 1000 of permanganate of potash in sterilised water, or a sterilised solution of boric acid, and of the vagina by thorough washing out with 1 in 1000 of formalin solution, lysol, traumatol, or perchloride of mercury, followed by the insertion of a tampon of sterilised iodoform or chinosol gauze. (2) The want of thorough cleansing of the entire body of the patient by the use of a warm bath, in which the skin is well scrubbed with lysol soap. (3) Defective shaving of the entire hair of the external genitals after the final bath has been taken, this being followed by proper packing of the abdomen with an antiseptic pad, such as 1 in 1000 of formalin. (4) Want of attention to the clothing of the patient when placed on the operating-table, as to its warmth and cleanliness, and omitting to see that the feet and legs are well enveloped in sterilised flannel bandages. (5) Inefficient sterilisation of the abdomen (especially of the umbilicus) or of the vagina—of the abdomen and umbilicus by a special washing when on the table with lysol soap and a brush, perchloride of mercury with alcohol, and finally ether; the vagina I shall refer to again. (6) Inefficient sterilisation of the hands and arms of the surgeon, assistants, or nurses, or, subsequent to their sterilisation, the touching or handling of non-sterilised articles. It is obviously ridiculous to see a surgeon who has prepared his hands making a resting place for them on his hips, search in his waistcoat pockets for a knife or pencil, place them on the sides of a chair or stool, twirl his moustache, or use a pocket-handkerchief; but even worse acts of forgetfulness than these have been noticed and commented upon by those who have visited some of our operative theatres. Nothing should touch the sterilised hands or arms of anyone engaged in an operation after the completion of their sterilisation. Though one who is experienced in the preparation of the hands may complete the sterilisation in a period of five minutes, much longer is required by the inexperienced assistant or nurse. No one engaged directly in any gynæcological examination should have a projecting finger-nail. The nails require daily attention, and immediately before the operation, during the washing of the hands, they should be finally prepared with shears. Again, it is absurd to prepare the hands before having put on the operating overalls or aprons—otherwise it is impossible not to touch the ordinary wearing apparel. Finally, there should be free washing of the hands and arms in equal parts of absolute alcohol and perchloride of mercury solution, 1 in 1000, which is then washed off by a running stream of sterilised water as hot as it can comfortably be borne. As yet it is difficult to get the thoroughly trained aseptic nurse. It is pitiable that women are still turned out from their probationary course of training in such absolute ignorance of what should be the most essential part of their education. It is no uncommon thing to find a gynæcological trained nurse preparing for an operation or dressings with long sleeves and cuffs, handling promiscuously the clothes or coverings of a patient and dressings or appliances, with the crudest ideas of sterilisation and a happy but reckless disregard in the handling of antiseptic dressings; the mixing of non-sterilised with sterilised water, in the using of cans and taps; *in washing with nail-brushes that have been employed previously and indiscriminately in private houses, homes, or in hospital;* and with a startling indifference (in the post-operative dressing of cases) to the preparation of their hands and the possibility of conveying infection from septic cases that they may have at the time been attending to (Fig. 2). Worse still is their tendency to use the first towel or instrument that comes to hand, pleasantly oblivious as to its previous effective sterilisation. (7) Failure may be consequent upon imperfectly sterilised sponges, gauze compresses, or dabs; or, even if these have been made sterile, by their being brought in contact with any source of infection, either through the hand of a

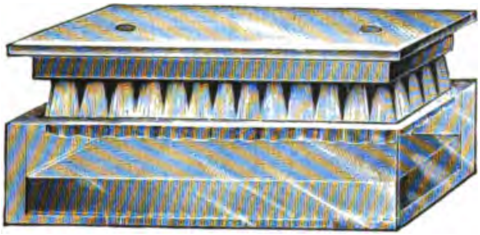

FIG. 2.—Aseptic nail brush attached to glass lid of its glass box. Each nail brush should be kept in its own glass box, and after sterilisation should rest in 1 in 1000 formalin solution. It can be carried thus sterilised in the surgeon's bag.

nurse or assistant, or by careless re-use when they have been infected. Ordinary sponges, save for exceptional purposes, are no longer used. The difficulty of keeping them sterilised, and the danger of trusting to nurses for their purity, have caused them to be generally abandoned. Gauze answers for almost every purpose, and soft white muslin squares or fine domett for protection of the bowel or for larger compresses. These and the sponges made of absorbent cotton-wool can be readily sterilised in the vapour steriliser or autoclave of Chamberland. Additional security for the preparation of the larger compresses when the muslin is new, can be had by boiling them in a solution of permanganate of potash for about half an hour, after which they are treated with bisulphite of sodium in order to decolorise them.[1] They are then washed in boiling water, so as to remove every trace of sulphurous acid, when they are dried and sterilised in the Poupinel stove. They can then be kept either in a solution of carbolic acid or sublimate. If ordinary sponges are used, they should be prepared by the permanganate of potash method, followed by decolorisation with either oxalic acid or bisulphite of sodium, thorough washing with sterilised water, and retention until required for use in a 5 per cent. carbolic solution. It may be well to have always some such sponges at hand if required, more particularly the larger and flatter ones. For all practical purposes in any private installation, the stove of Poupinel and the autoclave of Chamberland are sufficient for every purpose of sterilisation, whether of sponges, compresses, dressings, or instruments. The nickel jars in which these are sterilised, and sterilised towels wrung out of 5 per cent. of carbolic acid, enable us to carry our sterilised appliances any distance safely. (8) Failure arising out of infected instruments is not likely to occur with any care; and if they be sterilised by means of a dry stove, and are of such a kind that they can have their blades and handles easily detached, so that the joints may be thoroughly subjected to the necessary heat. Danger more frequently arises from the use of instruments infected during the operation, and which are not re-sterilised at the time. This is perhaps best obviated by having always at hand a nickel stove in which the water containing the sulphide of sodium is kept boiling, and into which the suspected instrument can be placed for some minutes before it is again used. This applies especially to needles which have been employed for suturing or ligaturing within the area of infected tissues. Hence the wisdom of having always prepared for any gynæcological operation a sufficient supply of all instruments that may possibly be called for, as, in emergency, imperfectly sterilised instruments may be used, or it may not be possible at the moment to re-sterilise an infected instrument. It is not necessary to comment on the re-use of any instrument or appliance which has once fallen from the hand of the operator. (9) While the position of Trendelenburg is invaluable in the majority of pelvic operations, it has its dangers with regard to asepsis, from the tendency for infective fluids to gravitate from the pelvic cavity to the bowel, and thus infect the latter. Therefore, in such cases, the large flat natural sponges come in of use in protecting the bowel, and the extreme Trendelenburg position should be avoided. Judicious irrigation, with sterilised saline solution, followed by careful drying of any cavity, and of the irrigated parts with gauze tampons or sponges, is the best means that we can adopt. If there be a fear of post-operative hæmorrhage, the iodoform gauze compress of Mikulicz, pressed down into the dried cavity, affords us the greatest security. No operation of any importance should be commenced without the sterilised needle for submammary injection of artificial serum being in readiness, together with the sterilised saline solution, so proportioned as to make with the addition of sterilised warm water the strength of 7 in 1000 at a temperature of 100°, to allow for cooling to 90° (Fig. 3). The plan I adopt of closing the abdominal wall is by triple suture; the peritoneum with fine silk, the fascia and muscle with stronger silk, and the skin with silkworm gut. I am most anxious about the careful co-adaptation of the fascia. Some prefer sterilised horse-hair for the skin. This is the suture adopted by Doyen, and I daresay it is equally good. Many advocate the single suture, carefully applied, taking special care with regard to the muscle and fascia, but for many reasons I adhere to the plan I have mentioned. (10) When an operation is completed, and the hæmostasis is assured, and drainage if necessary provided, there are still remaining some most dangerous loopholes for sources of infection. These are to be found in the abdominal or vaginal toilet. The use of infected needles, imperfect sterilisation of silk or catgut, as well as in the dressings of the wound, may furnish these. Needles that have been used for suturing or ligaturing infected parts, the handling of gut or silk, for neither should ever be handled after sterilisation, and should reach the wound only through sterilised forceps or scissors (Fig. 4). In like manner the

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[1] Two litres of 1 in 1000 permanganate solution are calculated for about 2 oz. in weight of sponges. The latter are washed with sterilised water, after some hours' resting in the permanganate liquid, so as to free them from the precipitate of oxide of manganese. About 2 oz. of a 10 per cent. solution of bisulphite of sodium in the 2 litres of water will be required to thoroughly decolorise the sponges, and 1 drm. of pure hydrochloric acid is added to the solution.

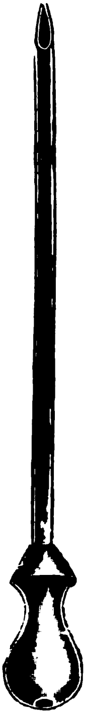
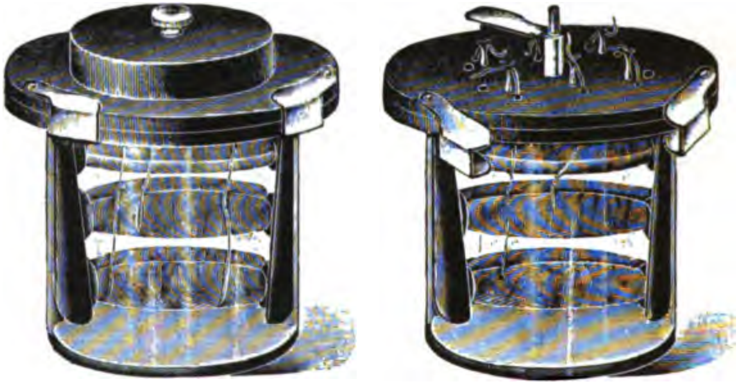


FIG. 3.—Convenient hypodermic artificial serum needle for sterilisation, to fit on tube.

sterilised dressing for the wound, after the latter has been washed with 1 in 1000 of formalin, and dried, should be laid over it direct from the jar or bottle in which it has been sterilised or hermetically kept, and the same remark applies to the superficial sterilised wool covering. During any aseptic operation, there should be close at hand to the operator either a lavabo with tap with sterilised water, or a basin with antiseptic fluid, renewed from time to time, in which the hands can be rinsed; and after dealing with infected parts, or any combined operation when passing from the vagina to the abdomen, re-sterilisation of the hands should be practised before again proceeding with the operation. It is a good plan to dust the surface of the closed wound with dermatol, which is readily sterilisable, and is not irritating. I generally prefer, however, the washing of the surface of the skin with formalin, and then the application of the sterilised iodoform gauze.



Closed. *Open for use.*

FIG. 4.—Leiter's hermetically closed vulcanite and glass jar for silk reels, containing six different sizes of sterilised silk, which are kept in a 5 per cent. carbolic solution until required.

With regard to the disputed question of drainage, it will be generally agreed that it is safer to drain in any of the following circumstances:—(*a*) When pus has escaped into the peritoneal cavity. (*b*) When there has been considerable hæmorrhage difficult to arrest, and in which it has been necessary to use the aseptic tampon to restrain it, and when there is the consequent danger of the formation of clots. (*c*) In the presence of septic complications, where there has been an escape of septic fluids, and, as is frequently the case in such instances, where extensive adhesions have necessitated prolonged stripping of tumours or sacs, with consequent more tedious manipulation. (*d*) Drainage is indicated in certain cases of enucleation of myomata—in panhysterectomy for myoma, when there is the complication of pus tubes, or suppurating cysts of the ovary; when there has been hæmato-salpinx or blood cysts of the ovary or meso-salpinx which may have been ruptured; in pan-hysterectomy for cancer; in some cases of supravaginal hysterectomy, with complications similar to those just mentioned, and where we are in doubt as to the infectivity of the cervical stump and canal. Here the plan may be adopted of dividing the cervix, covering each separate pedicle, and passing the iodoform drain between the two; in sanguineous and suppurative ovarian cystomata; in colloid multilocular cystoma in which there is ascites present, and where there has been rupture of the cysts with escape of the contents into the peritoneal cavity.

Drainage is necessary in colpotomy performed for pyo- or hydro-salpinx, hæmatocele, and other cases of ectopic gestation, and in suppurating cysts of the ovary, or meso-salpinx. Drainage is indicated in vaginal operations and in cœliotomy, when there have been wounds of the bladder or bowel. Some may think that drainage is not necessary in a few of the conditions here mentioned. but I believe, with a view to asepsis, that temporary use of drainage under *all* these circumstances is better than the risk run by immediate closure of the wound. If we do drain by means of a tube, it should be taken straight from the carbolic immersion fluid, having been previously treated by boiling in a 5 per cent. solution of permanganate of potash, decolorised by bisulphide of sodium, and afterwards boiled in distilled water.

The antiseptics that I use are carbolic acid, corrosive sublimate, formalin, iodoform, lysol dermatol, and traumatol. The last-named I have tried recently. It is asserted for it that its antiseptic power is as strong as corrosive sublimate, and from experiments made comparatively with iodoform, upon cultivations of the *Staphylococcus aureus* by dusting these with the powders, the traumatol treated cultures were not liquefied before the eleventh day, whereas the iodoform ones were completely liquefied in forty-eight hours. Injections of guinea-pigs with traumatol have proved how innocuous it is as compared with iodoform, and similarly in the case of its internal administration. It is an iodocresylic acid, and contains 54·4 per cent. of iodine, in combination with cresylic acid. Its bactericidal action would appear to depend more upon the cresylic acid than on the iodine, as it contains much less iodine than the iodoform. It has not the disagreeable odour of iodoform, but rather an aromatic smell. Corrosive sublimate I now only use for sterilisation of the hands, and the skin of the abdomen, or occasionally in sterilisation of the vagina. Formalin I use largely in the strength of 1 in 1000 for cleansing of the hands in post-operative dressings, wounds for the first few times, for vaginal douchings in the separation of sutures, and, when there are septic discharges, for the cleansing of sinuses (when I employ a strength of 1 per cent.). I also generally make it my first dressing after laparotomy, moistening the sterilised iodoform gauze in it. Formalin in vapour I avail of in the larger " Alformant " lamps for my operation-room and clothes cupboard. Drainage tubes are immersed in a solution of 1 per cent. before they are inserted. Glass catheters are always kept in formalin solution, two being used with every case in which catheterisation is necessary, one being taken fresh each time from the formalin solution. For ordinary douchings of the vagina I use lysol, and employ entirely lysol soap for washing purposes. Carbolic acid, save for keeping silk, drainage tubes, taps, douche pipes, and other appliances in, I never employ. The catgut is prepared by the method of Martin with corrosive sublimate, absolute alcohol, and oil of juniper, as I have fully described elsewhere. The gut which I use is kept in absolute alcohol (subsequent to complete sterilisation) for several months, before being taken out for an operation. The water used is first passed through a Chamberland filter and then boiled for half an hour.

The experiments of Ahlfeld, Reinicke, and Poten have been confirmed by Fuerbringer and Freyhau, that the bactericidal properties of alcohol, in combination with corrosive sublimate, are to be ascribed to the removal of the fat of the skin of the hand, while its power of uniting with water renders disinfection of the tissues easy by the associated sublimate or its subsequent solution, at the same time that the squamous epithelium and the superficial impurities as well as the bacilli are removed.

One word I may add on two matters — sterilisation of the vagina and the advantage of thorough antisepsis in the operation of curettage. With regard to the vagina, after careful washing of the external genitals with Holznolle sponge (Waschel) and antiseptic soap, which is continued with alternate douching for a few minutes, the vaginal walls internally are now well lathered with the same and washed with repeated douchings. This is done with the sterilised hand of the nurse. The uterine neck is now seized with tenacula, and drawn well down. Martin's curette is next used to the uterine canal, which is then douched out with

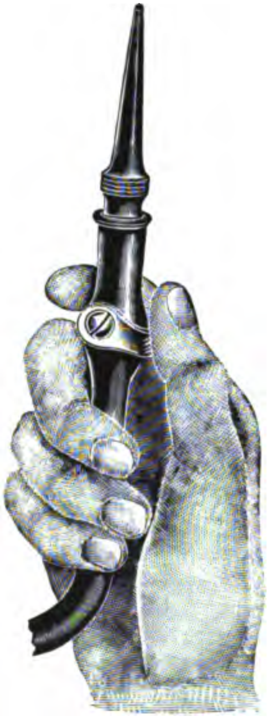


FIG. 5.—Most convenient vulcanite aseptic tap and nozzle for irrigation and douching.

the antiseptic solution, iodine, lysol, or other, as may be selected, or it is mopped out with a 20-gr. to the oz. solution of chromic acid. The vagina and cervix are thus sterilised (Fig. 5). After sterilisation of the cervical canal, it is the practice of some gynæcologists to amputate the lower portion of the cervix, and then suture the divided lips together. Others prefer the use of Paquelin's or the porcelain galvano-cautery.

With regard to curettage, its object, it must be remembered, is to obtain a new endometrium. It is not a step taken merely for the superficial "scraping" of the affected mucous membrane, and therefore if we want to secure permanent benefit from the operation, it has to be done thoroughly. After many hundreds of curetting operations, I have had only one subsequent trouble, and then in a case already curetted, and in which there was adnexal disease. Though every aseptic precaution was followed, pelvic abscess occurred at the left side, for which the abdomen was opened, the abscess was washed out, and drainage employed. The patient recovered. Still deaths have occurred even in the best hands after the use of the curette, and therefore we cannot be too particular in regard to our aseptic precautions. The plan I adopt is as follows:—Should it be a case requiring previous dilatation, the vagina is thoroughly prepared the day before, and the vulva shaved. The uterus having been fixed, a laminaria tent of the selected size, 4 in. in length (or two smaller ones if needful) is taken direct from the saturated solution of iodoform and ether in which it has been kept, washed in absolute alcohol, and then passed into the uterus, the vagina being tamponed with antiseptic gauze. The patient that night is given a full dose of bromide of potassium. The following day the tents are removed, the vagina is thoroughly sterilised; sufficient dilatation is secured by the rapid passage of uterine dilators; the uterine cavity is washed out with lysol solution, and then freely curetted with Martin's and the larger fenestrated sharp curette. The cervix, should it require it, is more vigorously dealt with, and the eroded tissues removed. A stream of antiseptic fluid is now allowed to run through the uterine cavity, which is finally dried by the introduction with a long curved forceps of successive strips of dry sterilised gauze. It is finally wiped out, according to circumstances, with a chromic acid solution of from 30 grs. to a

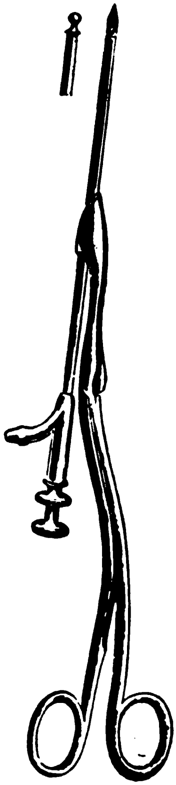


FIG. 6.—Aseptic trocar and cannula for use in vaginal exploration.

drm. to the oz. The external cervix, should it be eroded, is now touched with nitric acid. A strip of iodoform gauze is carried into the cervical canal, and the vagina tamponed with the same. The gauze is not removed for forty-eight hours, after which the dressing is renewed at intervals, and after the first week the vagina is antiseptically douched daily. Should aspiration by the vagina be determined upon for any reason, either diagnostic or therapeutic, the vagina is prepared with the same care as in any more serious procedure, a useful aseptic branched dilator and trocar being that of Landau (a somewhat similar instrument was devised by Christopher Martin), which is easily sterilised. The trocar and cannula having determined the presence of fluid, the branched dilator is pushed forwards, and thus the opening is enlarged sufficiently for irrigation or drainage (Fig. 6).

In concluding this paper, I wish to say that, all through life, I have been following as conscientiously as I could Listerian methods. I commenced when very young, in my early twenties, in the days of shellac and carbolic putty. I followed the spray through its various phases of development until it was finally abandoned. I can remember the horror and astonishment of colleagues when I first put up antiseptically and hermetically a bad compound luxation wound of the ankle-joint received from a reaping-machine, and having sawn off a portion of the malleus did not inspect it for several days. I can recall my first amputations and resections performed with those more primitive antiseptic methods. It is over thirty years since I published a case of "removal of retained placenta with hour-glass contraction of the uterus," where a decomposing syphilitic fœtus had been delivered by a midwife, and in which I had to bring away a putrefying placenta bit by bit, then washing out the uterine cavity with a strong permanganate of potash solution. For some eighteen years I was largely engaged in midwifery practice, both in public, "poor law," and maternity work. My first ovariotomy operation was performed over twenty years ago, and since then I have been mixed up more or less with gynæcological surgery. The result of all this experience is, that I have never had in my practice any case of death from sepsis in general surgery. I lost two cases in childbed from septicæmia; in one instance the infection being directly brought by a midwife who came straight from attendance on a septicæmic case that had died; the other, a forceps case, to which I was called when the child was dead, and the woman had been in the hands of a midwife for some days, and with the worst of surroundings. I have had two fatal cases in abdominal surgery arising from septicæmia. One died from infection of the peritoneum. It was a case of ascites arising from rupture of a multilocular colloid ovarian cystoma, some of the contents of which had escaped into the peritoneal cavity before operation. The second died from septicæmic peritonitis, arising in the tract of the abdominal wound after hysterectomy for myoma, and I have not the least doubt was brought about by some oversight in my technique. The first death took place many years since, and were I dealing with a similar case now I do not think I should lose it. I have not as yet lost any vaginal case. For the past seventeen years my operative work has been done in private, but it has included a very large number of the most serious procedures in operative gynæcology. From a consideration of these facts I trust that I shall not be regarded as fanatical in my advocacy of a perfect aseptic method.

ON THE MECHANISM OF THE INTESTINAL MOVEMENTS, AND ON REVERSAL OF THE INTESTINE.

By J. L. Bunch, M.D., D.Sc., M.R.C.P., *Assistant Physician to the German Hospital and to the North London Hospital for Diseases of the Chest.*

So great has been the progress during the last few years in the operative treatment of intestinal affections, that many cases now come within the scope of surgical interference which would formerly have been regarded as beyond all hope of relief. Whereas, in former days, operations for malignant disease of the intestine were postponed as long as possible, and then simple colotomy performed, the growth can now be fearlessly excised at an early stage, and the patient may reasonably hope that his life will be appreciably prolonged by the operation, even if recurrence is not altogether prevented. In skilled hands, partial resection of the intestine is now by no means a dangerous operation. In fifty-seven cases Kocher has resected the pylorus, and in these the immediate mortality was under 9 per cent.; in one case a woman was alive and well ten years after the operation. Such a favourable result is largely owing to the avoidance of sepsis, and also to a better understanding of the mechanism and functions of the intestine, based upon experimental results. The normal movements of the intestine have for many years been investigated by physiologists, and as long ago as 1837 the influence of various nerves upon the muscular walls of the intestine was studied by Johannes Müller, who was the first to show that stimulation of the splanchnic caused intestinal contraction. But only recently have the complicated intestinal movements been successfully analysed and the significance of the various contractions of the intestinal walls appreciated.

When the intestine is exposed in a warm bath, regular pendulum movements are found to be taking place at the rate of about twelve a minute, and travelling along the wall of the intestine from 2 to 5 cms. per second. These myogenic rhythmic contractions closely resemble those contractions of the walls of blood vessels which have been described by Schiff as occurring in the artery of the rabbit's ear, and have been observed in Traube-Hering curves in the veins of the cat's ear, and in capillary vessels constituting the so-called tache cérébrale. Laschinger[1] has even observed rhythmic pulsation in the vein of the bat's ear as long as twenty hours after death, when artificial circulation was still carried on.

A *second* form of intestinal contraction is the peristaltic wave, which only travels from above down (as has been shown by Ludwig and Schwarzenberg, Cash, Hess, and others), and is independent of connection with the central nervous system, though possibly dependent to some extent on functional activity of the cells of Auerbach's and Meissner's plexuses. This is the force which propels the intestinal contents in their downward course, and the contractions may be set up by any stimulus applied to the intestinal wall either from within or from without. Nothnagel showed that, in addition to the contraction taking place above the point of application of the stimulus, dilatation of the intestine was produced below this point. And stress has since been laid on this phenomenon, under the name of "the law of the intestine." The application of an electric stimulus to one point of the wall causes so great an effect when it is continued for a short time, that the constricted portion above the point of excitation will even force its way down into the lower dilated portion, and produce an intussusception. Guerin,[2] v. Basch,[3] and others have called attention to the same phenomenon, and it has been suggested that the dilatation taking place below the foreign body may exert a suction action which tends to aid it in its downward course.

A *third* form of intestinal contraction is best seen in animals recently killed. It travels rapidly, about ninety times as fast as the peristaltic wave, both in an upward and a downward direction, but it is only seen when the intestine is in a very excitable condition. This form of wave explains the antiperistalsis which is present in certain varieties of intestinal lesion. It has been found that when two of these waves which are travelling in opposite directions meet, the entire contraction is inhibited and the intestinal wall comes to rest.

Now, inasmuch as the muscular walls of the intestine are liable to various forms of contraction, it is obvious that this reaction to external stimuli will be somewhat complicated, and to this we may ascribe some of the contradictory results which observers have from time to time recorded. Thus, while anæmia produced by blocking of the aorta has been shown by Betz,[1] Mall,[2] and Bayliss and Starling,[3] to abolish the rhythmic movement, the intestine becomes from want of oxygen very excitable, and the rapid variety of intestinal wave is then easily set up, as noticed by Schiff,[4] so that two apparently diametrically opposite results of anæmia have been described.

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[1] *Arch. f. d. ges. Physiol.*, Bonn, Bd. xxvi.

[2] *Compt. rend. Acad. d. sc.*, Paris, tome lxxxiv.

[3] *Wien. med. Bl.*, 1885.

A still more vexed question is whether the two coats of the intestine contract simultaneously or alternately. Most observers agree that in the rhythmic pendulum movements both longitudinal and circular coats contract together, and that inhibition or augmentation of these movements implies a similar and simultaneous effect on both coats. But whether, under all other circumstances, both coats are affected in the same sense, is not so certain; and though I am inclined to think that such a simultaneous reaction is the rule, nevertheless some observers have obtained results which point to a difference in reaction of the two coats to certain stimuli. Thus, it has been stated[5] that the application of a constant current to the intestine causes, at make of the current, a contraction of the longitudinal coat at the kathode and of the circular coat at the anode. During the passage of the current the contracted ring at the anode is the source of origin of peristaltic contractions. At the break of the current the reverse effect takes place, namely, contraction of the longitudinal muscles at the anode, and of the circular at the kathode. Some similar results to these have been obtained by Bayliss and Starling.

Paralysis of the intestine brought about by lesions of its nerve supply, and more especially the temporary paralysis produced experimentally by considerable doses of nicotine or cocaine, is a paralysis of the peristaltic and not of the myogenic rhythmic contractions. Peristaltic contractions cannot in such an intestine be set up by mechanical stimulation; a slight pinch has no effect on the intestine, a very strong pinch causes a band of constriction in consequence of the direct stimulation of the muscle fibres. This constriction passes off gradually without being propagated in either direction. A bolus may be placed anywhere within such an intestine without causing any change; the bolus remains in the spot where it was inserted.[6]

The small intestine is under the control of the central nervous system, through the intermediary of both the splanchnic and the vagi. The action of both these nerves has been much disputed, from the time of Müller up to the present. In 1837 he showed that stimulation either of the splanchnic nerve or of the cœliac ganglion caused contraction of the intestine, and that this result was still obtained after section of the vagi. Later on, in 1853, Ludwig found that excitation of the splanchnic caused inhibition, while *section* of the splanchnic produced no alteration of the normal rhythm. These results of Müller and of Ludwig I have been able to confirm,[1] and to show that the splanchnic contains both motor and inhibitory fibres for the intestine. There has also been put forward a theory that the innovation was a crossed one —that if the splanchnics were motor nerves for the longitudinal, they were inhibitory for the circular coat, and *vice versâ*. The French physiologists Courtade and Guyon go still further, and maintain that the splanchnics contain motor and inhibitory fibres for *both* layers of muscle, but the evidence in favour of this theory is not altogether conclusive.

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[1] *Ztschr. f. rat. Med.*, Bd. ii. S. 1.
[2] *Johns Hopkins Hosp. Rep.*, Baltimore, 1896, p. 37.
[3] *Journ. Physiol.*, Cambridge and London, vol. xxiv. p. 119.
[4] "Lehrbuch d. Physiol.," S. 105.
[5] Biedermann and Simchowitz, *Arch. f. d. ges. Physiol.*, Bonn, Bd. xlv. S. 369.
[6] Bayliss and Starling, *loc. cit.*, p. 116.

The vagi also contain both augmentor and inhibitory fibres for the muscular coats of the intestine, although the augmentor effect is with difficulty obtained until the stimulus has been repeated four or five times.

The question arises as to whether either the splanchnic or the vagus effect is due to a direct action on the blood vessels of the intestine, since the splanchnic has been shown plethysmographically to contain both vaso-constrictor and vaso-dilator fibres for the intestine.[2] That this is not the case, is shown by the fact that the vasomotors of the intestine may be so paralysed that no effect is produced on the blood vessels of the intestine by stimulating the splanchnic, although contraction of the muscular wall is still induced. And other instances may be brought forward to show that the vasomotor and viscero-motor effects do not always coincide. The outflow from the cord of the two kinds of nerves is different, since the vasomotor fibres pass out along nerve roots as high as the second dorsal, while the viscero-motor fibres do not spring from the cord higher than the sixth dorsal.[3]

I have before mentioned that the rhythmic pendulum movement of the intestine may travel in either direction, and very considerable interest attaches to some experiments of Mall,[4] in which the attempt was made to force the intestine to work in the wrong direction, in order to test the possibility of carrying out the operation suggested by Nicoldani.[5] Eleven dogs were operated on, but eight died of peritonitis. In the remaining three, a segment of intestine was drawn out of the abdominal cavity, washed with mercury lotion, and divided above and

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[1] *Journ. Physiol.*, Cambridge and London, vol. xxii. p. 379.

[2] Bunch, *ibid.* vol. xxiv. p. 95.

[3] *Ibid.*, p. 92.

[4] *Johns Hopkins Hosp. Rep.*, Baltimore, 1896, p. 93.

[5] *Fortschr. d. Med.*, Berlin, 1888, S. 275. In malignant growths of the large intestine, when after excision the two ends cannot be brought together, the small intestine is cut across, and the proximal end of this sutured to the proximal end of the large intestine, while the distal cut end of the small intestine is sutured to the distal end of the colon.

below. The upper end of the loop was now sutured to the lower cut end of the alimentary canal, and the lower end of the loop to the intestine coming from the stomach. The food which might now pass from the stomach to the rectum would be compelled to pass through the loop in what may be called the wrong direction. In one case, the dog had quite recovered from the operation eight days afterwards. But three weeks after the operation he did not seem so well, was out of sorts, and did not appear to be so much inclined to play as formerly. Two or three days later, his condition was still worse; he would not touch milk or fat, and would eat lean meat only after a lot of coaxing. Stools were however passed regularly. Twenty-five days after the operation, as he did not improve, the abdominal cavity was opened, and it was found that the intestinal segment was enormously distended, in spite of there being no obstruction of the bowel. The sutures were well healed, and the intestine in the neighbourhood of the lower suture showed no marked signs of inflammation. Passing from the lower suture upwards towards the stomach, the segment of intestine became more and more dilated, reaching its maximum at the upper suture, when the dilated portion was found to be filled with hay, other indigestible substances, and a considerable quantity of yellowish-black liquid. The mucous membrane was much eroded, but at no point was there any kinking or narrowing of the intestine.

In the second case, the dog, after a similar operation, lived for sixty-four days, and on opening the abdomen the reversed segment of intestine was also found to be very much distended. In this case the vessels passing to the reversed portion were all enormously dilated and elongated, showing that the dilatation was accompanied by active growth, and was not a merely mechanical distension. The irritability of the intestine, when tested, showed a striking result. Stimulation of any portion of the intestine, other than the reversed portion, produced first a primary wave which ran towards the stomach, and then a secondary wave which ran in a direction away from the stomach, while in the reversed segment a double wave was also produced, but in a sense exactly opposite to that seen in the normal intestinal area. Throughout the reversed portion the primary wave ran towards the cæcum, and the secondary wave travelled towards the stomach; in fact, although the intestine had been reversed for sixty-four days, it behaved exactly as it did before the operation.

On microscopic examination, it was found that in the upper portion of the dilated part, practically the whole of the mucous membrane and part of the submucosa had been destroyed, while the muscular coat was extensively infiltrated with leucocytes. Somewhat lower down the mucous membrane was in great part wanting, but a few crypts remained, which had grown into the submucosa, and were composed of cells whose power of resistance was more marked. The researches of Bizzozero,[1] who demonstrated the occurrence of numerous karyokinetic figures in the cells of this region, show that the proliferation of the lining cells of the intestine takes place at the base of the crypts of Lieberkühn, and, taken in conjunction with Mall's results, point to the fact that the power of resistance is greatest in those cells whose vitality is most marked.

In the third case, the dog only lived for seventeen days after the operation, and died of malnutrition due to constant vomiting. The distension of the reversed segment of intestine was as well marked as in the two preceding cases, and the whole intestine was found empty, with the exception of the dilated portion.

In all three cases, therefore, the segment of intestine in which the normal direction of passage of the food had been reversed, was found to be greatly distended in the neighbourhood of the upper suture. This distension was present on both sides of the suture, though more on the distal than on the proximal side, and the explanation of this must be taken to be that, owing to the normal direction of peristaltic action being retained in the segment of intestine which had been reversed, there was a tendency for all the contents of the intestine above the level of the suture to be propelled towards the upper point of junction of the two segments. But inasmuch as the reversed portion of intestine was smaller than the portion of intestine above it, a greater force was brought to bear upon the distal than upon the proximal side of the suture, and the dilatation was in consequence more marked there. That no complete obstruction of the intestine was, however, produced, is shown by the fact that the stools were regular and abundant, but they contained very little solid material. Any alteration in the animal's diet produced a difference in the quality and consistence of the stools, so that it was obvious that a certain amount did pass through the dilated part; indeed, we should expect the distension of the upper sutured portion, which had resulted from a propelling force acting in two opposed directions, to be associated with the presence of an occasional reflex wave which would help to convey some intestinal contents in a downward direction. This would naturally apply rather to fluid than to solid particles, and in these experiments it was found, on opening the intestine, that the region of the upper ligature was usually blocked with a quantity of indigestible solid material, such as hay, hair, and similar substances. One dog was at different times given seventeen glass marbles, in order to see how many would pass through the intestinal canal in safety. Some were given twenty-eight days after the operation, and of these one passed right through, and was found in the fæces three weeks afterwards. Of the eleven given about the same time, only one succeeded in making the somewhat difficult journey in safety, while the animal was alive; six more were found post-mortem entangled in the hay in the neighbourhood of the upper suture; while the remaining four were probably vomited. A similar fate befell another half-dozen balls which were given at a considerably later date—a fortnight only before the animal's decease—but still before the animal had begun to vomit his ordinary food. Dogs seem as a rule to retain substances within the stomach until they are digested, or, if unsuccessful in this, to eject them summarily. Human beings, on the other hand, frequently allow foreign bodies, such as forks, pipes, whole mice, and similar objects, a safe and easy passage through the pylorus into the duodenum, greatly to the detriment of the latter. An interesting point brought out by Mall's experiments is that, even when the operation is performed sufficiently low down to have what one would imagine to be a long enough portion of intestine above to carry on nutrition, nevertheless inanition sets in, and the animal dies with all the symptoms of intestinal obstruction, although the intestine is in no way obstructed—it is in fact even dilated.

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[1] *Arch. per le sc. med.*, Torino, 1887.

THE CLINICAL VARIETIES OF VISUAL APHASIA.

By W. ELDER, M.D., F.R.C.P.Ed., *Physician, Leith Hospital.*

SINCE Dejerine clearly differentiated two of the varieties of *cécité verbale*, or word-blindness, a good many cases have been published, confirming in great part the accuracy of his observations and conclusions; but there are still many interesting points in connection with the discussion of visual aphasia, and the visual perceptive centres, requiring more light to be thrown on them before accurate conclusions can be drawn. One of the following cases of my own observation confirms the accuracy of Dejerine's observations, both clinically and pathologically, and, when contrasted with the other cases here recorded, shows how various the symptoms may be, even in cases which are classed under the one head of "Visual Aphasia." It is impossible in an article like this to enter fully into a discussion of the whole subject of visual aphasia. My views on that subject I stated in my work on aphasia;[1] but I may state here that most writers on the subject, following Dejerine,[2] believe that there are two forms of word-blindness, namely, cortical and subcortical. Dejerine described these two forms from their symptoms as—(1) Cécité verbale avec agraphie ou troubles très marqués de l'écriture; (2) cécité verbale pure avec intégrité de l'écriture spontanée et sous dictée. And he showed by post-mortem examination that whilst the first variety is due to a lesion in the angular gyrus and posterior part of the supramarginal convolution, the second variety is due to a lesion cutting off the word-seeing centre in the angular gyrus from the half-vision centres in the posterior and internal parts of the occipital lobes. In this latter condition the word-seeing centre is intact, and the lesion is subcortical, as far as the word-seeing centre is concerned, although the cortex further back may be involved in the lesion. Briefly stated, the symptoms of these two varieties of word-blindness are the following:—

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[1] "Aphasia and the Cerebral Speech Mechanism," London, 1897.

[2] *Compt. rend. Soc. de biol.*, Paris, 1891 and 1892.

1. *Pictorial word-blindness, cortical alexia, or pictorial visual aphasia,* shows itself by the patient not being able to read to himself, nor aloud, nor to understand words or letters written or printed. He also very distinctly shows agraphia. He is not able to write spontaneously, nor to dictation. If he copies, he simply traces as he would a drawing. If uncomplicated, he sees objects, etc., quite well.

2. *Infrapictorial word-blindness, subcortical alexia, or cécité verbale pure,* shows itself by the patient not being able to read to himself, nor aloud, nor to understand words or letters written or printed. He, however, is able to write spontaneously, and to dictation, but only copies, as he would a drawing. He cannot copy printed into written characters. He may see objects, etc., quite well, but many of these cases suffer from hemianopsia, from an involvement of the radiations of Gratiolet in the lesion. These are the symptoms which patients exhibit in a more or less marked degree, depending on the degree of involvement of particular areas of the brain, although other factors may also play an important part in the cause of the variations in symptoms.

Bastian,[1] in order to explain some cases of word-blindness which occur without agraphia, although the angular gyrus is destroyed, divides the first variety into two subdivisions. His classification is the following:—

1. *Effects produced by destruction of the left visual word centre.*—(*a*) Cases of disease of the left visual word centre, causing word-blindness and agraphia—ordinary cortical word-blindness. (*b*) Cases of disease of the left visual word centre, causing word-blindness without agraphia (one form of pure word-blindness).

2. *Defects resulting from isolation of the left visual word centre* (other form of pure word-blindness).

Whilst Bastian's second subdivision probably does occur, and it is difficult explaining some cases under any other supposition, it seems to me they are rather to be looked upon as exceptions to the general rule that complete destruction of the left visual word centre is accompanied by agraphia. Bastian states (*op. cit.*, p. 187) that "there are only two cases with necropsies that I can bring forward in illustration of this group, and unfortunately they are not very well-defined cases, being rather complicated, not only clinically, but also by reason of the lesions found at the necropsy." The two cases are, one of Broadbent's,[1] and a case of Osler's.[2] Bastian also cites a case of Charcot's, recorded by Bernard,[3] in which, however, there was no autopsy; but of this case Bastian himself makes the remark, "The destruction of the visual word centre does not seem to have been complete, as the patient could still recognise individual letters."

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[1] "Aphasia and other Speech Defects," London, 1898.

Whilst doubting whether the evidence produced by Bastian is sufficient to justify one in making a subdivision of group 1, having a distinct pathological basis, most observers will, I think, admit the argument that Bastian brings forward in its support. He says (p. 186): "The effects of destruction of the left visual word centre are liable to vary much in different individuals, in accordance with their different sensorial aptitudes and different degrees of education, just as we have found the results of destruction of the left auditory word centre to present marked differences in different cases. The results already described under group (*a*) are those which most frequently follow when the left visual word centre is destroyed in ordinary individuals. But suppose a similar lesion to occur in a person who is a strong "auditive" but a weak "visual," and at the same time, perhaps, an educated person who has previously been in the habit of writing much. It may happen in such a person, after the stage of learning to write has well passed, that the activity of the visual word centre whilst writing may be reduced to a minimum."

Again, later (p. 192), he says: "It will be observed that in each of these three cases in which word-blindness has been present without agraphia, the patients have been more or less educated persons, well accustomed to write, and that in the first two (Broadbent's and Osler's cases), at all events, the incitations could not have come during their illness from the damaged visual centre. Therefore it seems only open to us to suppose that these patients were able to write spontaneously or from dictation, simply because they could call up the familiar activity of the cheirokinæsthetic centre at the direct instigation of the auditory word centre."

Whilst agreeing with Bastian that this may, and probably does occur, I cannot agree with him in the statement that "in the first two cases, at all events, the incitations could not have come during their illness from the damaged visual word centre." The evidence is not conclusive that the left visual word centre was completely destroyed in these two cases, and the escaping destruction of a part of the left visual word centre, in these and other cases, may account partly, if not entirely, for their being exceptions to the general rule.

Anyone who has paid particular attention to the literature of aphasia cannot but have been struck with the immense number of variations in the symptoms of cases apparently belonging to the same group. As Bastian states in reference to the left visual word centre, "the effects of its destruction are liable to vary much in different individuals, in accordance with their different sensorial aptitudes and different degrees of education." The same remark more or less holds good with regard to the other word centres in the cerebrum; and this fact, I believe, not only accounts for many of the variations in symptoms produced by apparently the same pathological lesion, but also accounts for the many differences of opinion which have been expressed in recent years by observers of those cases, and for the immense amount of literature which in recent years has been produced on the subject. We have travelled a long way since Broca's days. Speech is now not considered to be a simple faculty, having a seat in one small area of the cerebrum. We have divided and analysed the processes by which language is acquired and produced, and found that, looking at it merely from a material point of view, the mechanism is a complicated one, having many elements. If each individual had the same mechanism, the same aptitude in acquiring and producing language, and the same method and manner in his education as well as the same environment, the result would probably be much the same in each individual brain, and there would not be such a variation in the symptoms produced by what is apparently a similar lesion. But as individuals vary in these respects, so may their brains, and so do the symptoms of lesions in particular speech areas. My purpose in this paper is to show a few of the variations which may occur in cases of visual aphasia. We have evidence, as pointed out by Dejerine, that some of these variations have a pathological basis, but much evidence is still wanted to prove or disprove that there is a distinct pathological basis for other variations.

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[1] *Med.-Chir. Trans.*, London, 1872, p. 162.

[2] *Am. Journ. Med. Sc.*, Phila., 1891, p. 219.

[3] "De l'Aphasie," 1885.

It will be helpful here to make a few preliminary observations on the acquiring and production of written speech.

Letters are conventional symbols, which are used to convey an idea to an individual, through his sense of sight. These symbols in European languages rarely convey an idea when used singly. If they were only used singly in a language, it will be seen that it would be necessary to multiply the letters of the alphabet a thousandfold. In some Eastern and ancient languages there was a certain approach to one symbol representing an idea; but, in the languages which have adopted the alphabet, letters require to be combined into words of various number of syllables. Each word or combination of letters, therefore, has its own meaning, or conveys an idea to the individual who sees it written or printed. It conveys an idea, because it, in the first place, usually (although after much practice, probably not invariably) calls up the auditory image or equivalent (the sound of the word), and, in the second place, calls up the other associations of both its visual and auditory elements. But single words are not sufficient to express all ideas, so it is necessary to use combinations of words, which we call sentences. It may be said that even a sentence does not express fully a particular idea, so it is necessary to have a combination of sentences or paragraphs, and even a combination of paragraphs or whole books, to express an idea; but for all practical purposes we may stop at sentences, because, although some people could take in a whole page at a glance, there are very few with their visual and associated faculties so highly developed. Most take in or read words separately, and a few read short sentences without apparently going through the process of reading the individual letters or even the individual words of the sentence. This, with ordinary methods of education, comes from practice and greater familiarity in reading; but there is a system of education which has, I believe, been very successful, where the pupil is taught not by letters, but by words and sentences, so that he may be able to read quite well, and not know the individual letters of which the words are made up. It has to be borne in mind that a person taught by this word-sentence method would probably show considerable variation in symptoms from the usual, if a pathological lesion affected the left angular gyrus, because, in such an individual, words and not letters are the elementary units.

Although this method of education is very modern in its introduction, it is possible that in some individuals, after much practice in reading, the words become practically the elementary units, the component letters scarcely at all being observed. One would expect much the same condition of brain in these individuals as in others who had been primarily taught by the word-sentence method. Theoretically, therefore, if one considers visual aphasia in its relation to the conventional letters, words, and sentences of a written and printed language, omitting at present all reference to figures, it is possible for a person to be letter-blind, word-blind, or sentence-blind; to be all three; to be letter- and word- but not sentence-blind; to be word- and sentence- but not letter-blind; to be letter- and sentence- but not word-blind. These are the theoretical varieties which might occur, if letters, words, and sentences had the same importance, and were acquired in the same way; but it only requires a very cursory examination to see that some of these varieties are not likely to occur, as, for instance, that in which a person would be sentence- and letter- but not word-blind; or the opposite condition, where a person would be word-blind but not letter- or sentence-blind. As pointed out by Bramwell,[1] in discussing a most interesting case of his own, "it is usually supposed that the highest degree of word-blindness is manifested by inability to read individual letters rather than individual words; that, in short, individual letters, which are generally considered to be the most elementary parts (least highly specialised) of written speech, as they are undoubtedly the first to be acquired, are the last to be lost and destroyed." This, undoubtedly, is the general rule, and it is usually found that where a patient is letter-blind he is also word-blind and sentence-blind; but there are exceptions, where the patient is letter-blind and not word-blind, the first published exception, so far as I am aware, being Bramwell's case. In this paper later I shall give a short account of a similar case, the notes of which were kindly sent to me by Dr. Love, Glasgow.[1] If the word-sentence method of education is considered, it will, however, be seen that patients who have been taught by this method would in all probability lose the power of reading letters before the power of reading words. Bramwell, in commenting on his case, says: "It might, therefore, at first sight be argued that the fact that a 'word-blind' patient, who was utterly ignorant of the individual letters as letters, but was nevertheless able to read combinations of letters or words, was opposed to the great doctrines of evolution and dissolution which Herbert Spencer, Hughlings Jackson, and others have so satisfactorily applied to the elucidation of the pathology of the nervous system, and which so greatly aid the intelligent comprehension of the derangement of the functions of the brain. When, however, the matter is looked at more closely, this apparent exception will, I think, be found to conform to the general rule. For, after the preliminary difficulties of learning to read have been overcome, and the act of reading has become facile, and has been frequently repeated, the individual letters are, by some persons at all events, ignored, and it is the combinations of letters, syllables, and individual words to which attention is chiefly directed. In short, it may be supposed that in some persons the syllable and individual word become, after a time, less highly specialised (*i.e.* more elementary) than the individual letters. If this be so, we should expect the form of word-blindness which I am now describing to be more frequent in well-educated and intelligent people, to whom the act of reading has, as it were, become automatic, than in uneducated persons, and those who, before their illness, could only read with difficulty, and by spelling out (by the help of individual letters) the separate syllables and words." Although this explanation of Bramwell's is quite a feasible one, it is rather strange that so few cases of letter-blindness without word-blindness have been recorded. One would have expected from this explanation that a much larger number of cases would occur, but such cases are very rare in medical literature. Almost all the cases of letter-blindness are also word-blind, and are not able to read at all. One explanation of this fact, I believe, is to be found in considering the production of written speech. As I have elsewhere contended,[1] if there is a graphic centre it is a letter or very familiar word or syllable centre only. Although we may have had so much practice and be so expert in reading that we are able to read by simply seeing the outlines of the words, the individual letters being neglected or not separately being taken note of, it is, as a general rule, quite different when we come to write the same words. When words are written we have to trace each individual letter separately, and in that way our motor writing centres (whether we call them true graphic centres or not) execute by means of the hand the necessary movements to produce each letter; and most of us are conscious of spelling out the words by individual letters, as well as seeing with our eyes each letter as it is written. This must have an effect on the visual centre, tending to make the letters and not the words the elementary units, and so counteracting to a certain extent the tendency to ignore the letters altogether, which might come from much practice in reading.

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[1] *Edin. Med. Journ.*, 1887, p. 242.

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[1] Since writing the above, I find that Dr. Hinshelwood, in his recently published work on "Word-Blindness," has also given an account of this most interesting case, as well as of another which was observed in the Western Infirmary, Glasgow, at the same time. The fact of these two cases occurring at the same time, he points out, rather tends to show that they are not so rare as is supposed.

Again, whilst it is quite common to find that a visual aphasic is word-blind, he is usually able to read some, if not all, letters. It is only rarely that a patient is so completely aphasic that he cannot read some letters. Why is it that it is rare for his power to read individual letters to be completely gone? In discussing this subject in 1897, I stated[2] that probably "the most specialised part of this word-seeing centre is situated further forward, or at least *not exactly* in the same place as the less highly specialised part, namely, the visual memories of the more familiar words and single letters. If such be so, it would explain the fact that some patients who may not be able to read long and unfamiliar words are able to read letters and small and familiar words—words that they apparently perceive as one object or form, just as they would a letter. It will be found that although a word-blind patient is not able to read words, he may be able to read figures. The explanation of this, as I have said, is because all the visual memories are stored not precisely in the same region, although it is probable that some of the more familiar and common visual memories may be imprinted also in the corresponding uneducated centre on the right side. Whether the visual perceptive centres alone (*i.e.* the half-vision centres), both angular gyri being destroyed, could enable an individual to see a letter, a figure, or small and familiar word, such as 'the,' as a letter, a figure, or 'the,' we do not at present possess sufficient knowledge to say definitely; but in all probability it will be found that the visual word-centre can be divided into various areas, each having its own special memories stored in it."

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[1] "Aphasia and the Cerebral Speech Mechanism," London, 1897.

[2] *Ibid.*

These are the views I expressed in 1897, which seemed to me the most feasible explanation of the clinical facts.[1] I would like, however, to remark here, that although I stated that probably the visual word-centre could be divided into various areas, having each special memories, I did not mean to convey the impression that there was a certain area in each brain in which certain word memories were stored, whilst in a neighbouring area certain other word memories were stored, and that it would be possible to define those areas. I simply meant to convey the idea that, as long as a pathological lesion did not destroy the whole of the left angular gyrus, there was the probability of some of the visual memories being spared, and that these varied in each individual case. I would add now that the symptoms will vary in each case, not only from, perhaps, a different point of the gyrus being spared, but also because each case has not had exactly the same method and manner of education, and according as the individual's left hemisphere is more or less pre-eminent over his right hemisphere.

I have already alluded to the importance of the method and manner of education on the question of visual aphasia. I would like now to say something as to the last point, the pre-eminence of the left angular gyrus over the right. As will be seen from the quotation above, I stated that it is probable that some of the more familiar and common visual memories may be imprinted also on the corresponding uneducated centre on the right side.

Since writing the above, it has been pointed out by Bastian, and his opinion he supports with a very convincing argument, that the right side of the brain does not take the very subordinate position in speech reception and production that was usually supposed.

Bastian says:[2] "It cannot be supposed that auditory impressions from spoken words do not pass from each ear to similar regions in the opposite cerebral hemisphere, and our present knowledge makes it equally improbable that the visual impressions of words are not registered in a visual word centre in each hemisphere. There is, as I believe, no question of an 'overflow' from one to the opposite hemisphere; on the contrary, each hemisphere receives its own proper share of ingoing impressions, and doubtless registers them in a more or less similar fashion. That this should be so seems an obvious truth, though it is one that hitherto appears to have been very imperfectly realised. So far, therefore, we seem bound to admit that each hemisphere has the chance of being equally educated, so far as the mere *reception* of speech impressions are concerned." Evidence is rapidly accumulating in favour of these views of Bastian, and if it is a fact that many, if not all, of the specialised visual impressions are registered in a more or less perfect manner in the right angular gyrus as well as in the left, as I believe they are, then we have an explanation of the fact that it is comparatively rarely that there is a complete visual aphasia for all letters, and also why figures and other specialised visual memories escape when longer and least familiar words may have all been blotted out. Another point, and one which I believe is even of greater importance than the mere *registering* of the specialised visual impressions in the right hemisphere as well as in the left, is that, although these impressions may be registered, there have not been established the elaborate associations with the centres on the right side as there have been on the left. This remark applies not only to the visual centres, but to the other speech centres; and although little attention has been paid to it, I believe that it is *the* most important factor in the determining of the *one-sided* nature of the speech faculty. It is not so much that the speech centres are on one side of the brain, as that the centres on the left side have established much more intricate associations than those on the right, and these associations are much more developed and used on the right side in some individuals than in others. The speech reception impressions may be all registered on the right side, but, owing to the want of establishment of the proper associations, these registered impressions are not so promptly, accurately, and completely received and made use of on the right side as on the left in most right-handed individuals.

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[1] Dr. Hinshelwood, in his recent work, advocates this view very strongly.

[2] "Aphasia and other Speech Defects," London, 1898.

Probably, therefore, individuals vary greatly in the relative importance of the two angular gyri in their visual speech reception, and hence the variations in the symptoms of individual cases.

And these variations are sometimes very peculiar. For instance, in a case of Batterham,[1] every letter was blotted out except vowels. It is not uncommon, for the visual memory, for figures to be retained, whilst the patient may be practically letter-blind. Sometimes the memory for Arabic letters is retained, whilst that for Roman has been lost, and *vice versâ*. Sometimes a patient can read musical notation, whilst blind to ordinary letters and words, or *vice versâ*, etc. These facts are all accounted for under the explanations I have previously given. Some of these memories and associations are, one would suppose, more likely to be developed in both sides than others, as, for instance, the memory for numerals. Figures, besides being probably more familiar to most people than letters, there only being ten symbols altogether used for numbers, have, I believe, more associations with the higher centres concerned in ideation. The figure 9, for instance, in addition to being the symbol for the word-sound *nine*

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[1] *Brain*, London, 1888, p. 488.

(as *A* is for the vowel-sound *a*), represents also the abstract idea "nine"—an idea which would probably require a whole sentence or more to explain. A letter is a symbol only, without much or no meaning; whilst a figure, in addition to being a symbol, has a definite meaning. This, in my opinion, helps to explain the fact that figures are less frequently blotted out in visual aphasia than are letters. Another point I have noticed in visual aphasia cases is that letters of a simple, uncomplicated form can be recognised and reproduced by writing, when the more complicated letters cannot. For instance, the letter *O* often can be recognised, and can be written by copying or otherwise, when the patient is blind to most other letters.

And now let me consider the writing of patients suffering from the different forms of visual aphasia. As has been stated, when the left angular gyrus is destroyed, the patient is agraphic. There have been a few exceptions to this rule, but this point has already been referred to. In this form, namely, cortical or pictorial visual aphasia, if the patient is able to read at all, either letters, words, or figures, he is also usually able to write in a corresponding way. The powers of writing bear a very close relation to the powers of reading. If he can read letters he is usually able to write letters, and a few small or familiar words. The signature can be usually written even by a patient who has very complete visual aphasia. If the whole signature cannot be written, some of the letters of it usually can, and it is not an uncommon thing to see a patient with this lesion writing either the whole signature or a part of it, as for instance the first name, or part of that name, over and over again. Usually the writing of these cortical visual aphasia cases is larger than usual, just as one would write with the eyes closed. They copy in the way that a child copies, or as one would copy a drawing, so that these cases, when asked to copy print from a book, instead of using manuscript letters, make an attempt at reproducing the print. In the same way, when asked to copy manuscript, they try to faithfully reproduce even any special flourish that may appear in the writing. They cannot convert printed (Roman) symbols into manuscript symbols, because symbols have no meaning to them, and they cannot read what they have copied. Neither are they able to arrange block letters (such as children use) to form words, nor can they be made to understand letters or words by tracing the outlines of letters with the finger.

Now, contrast this with the condition in *cécité verbale pure*, infrapictorial or subcortical visual aphasia. Here the ability to write has no relation to the ability to read. The patient cannot read. He may not be able to read words nor letters, or the power to read letters may be retained to a great extent, as in Case 3. While this is so, the patient is able to write voluntarily and to dictation. The angular gyrus is not destroyed, and the patient can therefore call up the forms of letters and words from within.

Whilst he can write, he is not able to read what he has written. This was a marked symptom in Case 3.

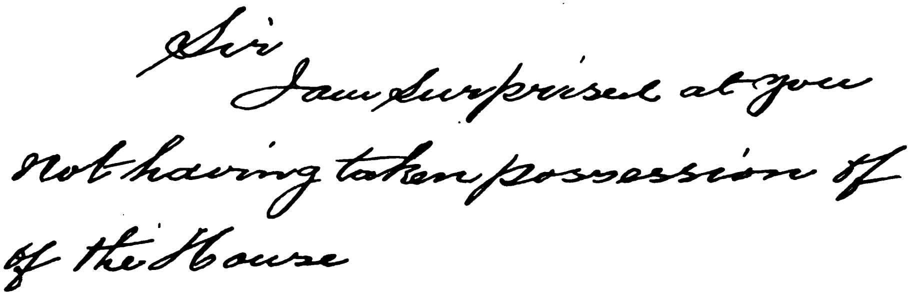
Although these patients cannot read in the usual way, it has been found that some at least are able to read by tracing the outlines of the letters with their fingers; in other words, by their muscular sense, or sense of position, which has established associations with the angular gyrus, and impressions are conveyed there which are sufficient to rouse the visual memories of the letters. Patients with this form of aphasia are also able to arrange block type into words, and can read those words by tracing with the finger in the manner stated above. The sense of hearing is also a great help to them in reading, because if they are able to read with the fingers, and pronounce each letter as they read it, they are sometimes able to combine the sounds of letters of the word or syllables into words or syllables, and so read them in the same way as children are often taught to read, by spelling out the word before pronouncing it. Case 3 was able to read in this way, not from tracing with the finger, but because she could still read letters, although she had lost the power of reading words in the usual way.

As illustration of many of the points referred to, the following cases are interesting.

The first two are cases of pictorial or cortical visual aphasia, but it will be seen how markedly they differ from each other in the blindness. Whilst the first was truly word-blind, the second was letter-blind only, and could read words. Although the first case could not read words, he showed a very marked tendency to spell, and used letters very frequently although incorrectly. The second, on the other hand, could not spell, although he used words freely.

CASE 1.—*Pictorial visual aphasia; word-blindness with inability to write voluntarily from dictation or from copy; death; post-mortem showed lesion in left angular gyrus.*—T. D., æt. 68, a messenger, consulted me on the 17th November 1898. He walked into my consulting-room direct from his work, where he had been engaged all day. He seemed feeble and dazed, and different from what he used to be in health. He had slight difficulty in speaking (dysarthria), there being very slight difficulty in getting the proper word and the proper pronunciation of the word. He thus spoke slower than usual, but always managed to say what he wanted to say.

He complained of feeling weak and of a swimming in the head, and had a pain in, and a slight difficulty in seeing with, his left eye. There was no paralysis, only a slight general enfeeblement of the muscular action of the whole body, the grasp of his right hand being specially noted as being as good as that of his left. Two days afterwards I was called to see him, and found him in much the same condition generally, but if anything rather weaker, and he had also an attack of vomiting. He continued much the same till the 29th November, twelve days after I first saw him. It was found at this time that the motor weakness was greater on the right side of the body, the right arm and leg being slightly paresed. It had been noticed for a few days previously by his wife that he could not raise the cup to his lips so easily with the right hand as with the left hand, and he dragged his right leg in walking.



Sir
I am Surprised at you
not having taken possession of
of the House

FIG. 1.—Handwriting of Case 1 before illness.

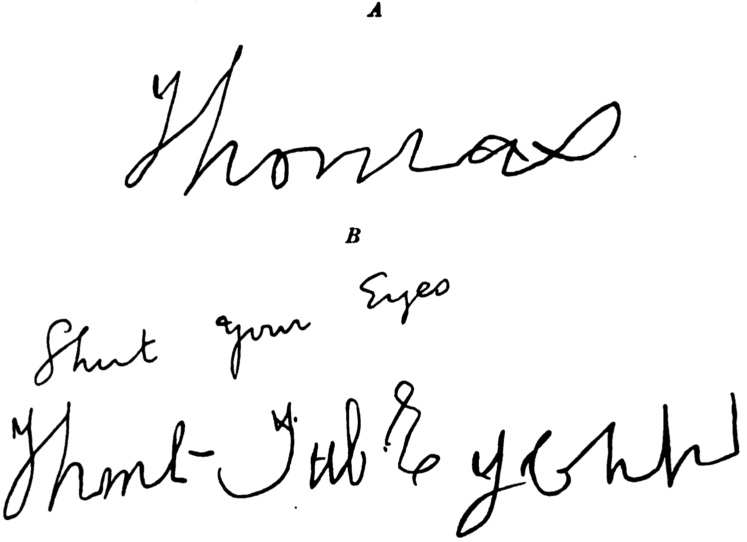

A
Thomas
B
Shut your Eyes

FIG. 2.—Writing of Case 1 on 29th November. *A*, Spontaneous writing of Christian name; *B*, attempt to copy "Shut your eyes," as written above.

During his illness his wife noticed that he had not desired to read, a fact which she considered peculiar, as she said "he was a good scholar." On the 29th November he was tested, and it was found that he could read a few small words, such as "on, it, to," etc., and could read some of the letters of the alphabet, but had a tendency to repeat some letters frequently when attempting to read (letter-intoxication). He could not read long words, and often when asked to read started to spell, some of the letters being correct, others incorrect. He could hear and understand what was said to him quite well, and he could speak quite correctly either when speaking voluntarily or repeating what was said to him, but he could not correctly read aloud, except as previously stated. He could at this time write his name, and one or two letters, but he had evidently a difficulty in remembering the forms of letters dictated to him. His writing was larger than his usual handwriting. He had considerable difficulty in copying. In Fig. 1 I show a specimen of his usual handwriting before the onset of his illness.

In Fig. 2 are specimens of his handwriting on 29th November. On 2nd December, on being carefully tested, the following condition was found:—There was slight motor paresis of the right side, both the arm and leg being affected. There was no anæsthesia. He complained of pain in and difficulty in seeing with his left eye, but no hemianopsia was found. He could hear and understand quite well what was said to him, and obeyed instructions that were given him, such as "Give me your left hand," "Put out your tongue," etc. He could repeat words and sentences. He could speak voluntarily, using correct words, and often long and perfectly framed sentences. He could name objects quite well, making no mistakes, and knew the uses of objects perfectly. He could not read more than a few letters, and *very few* small words, such as "to," "and," "on," etc. When asked to read a sentence, he started to spell or name letters, but the numbers of the letters used neither corresponded to the numbers of the letters in the words, nor the number of words. For instance, when asked to read from a book the following sentence:—"Like the English, the Spanish language has four moods," he said, *eiminmioeimimninminimeimo.* When asked to read another sentence on the same page, he said *oineimieimininii.* He was tested very fully in this way, and it was noticed that there was a marked tendency for certain letters to appear again and again, although they were sometimes varied in order, as for instance, in the above, *einimo* are the only letters that were spoken, but were varied in order. It is interesting to note that four of these letters occur in his own name; whether there is any relationship between the two it is impossible to say. He knew that he was not reading correctly, and seemed annoyed, but it was evident that it was only by hearing himself repeating one letter after another, which seemed to him rather a peculiar way of reading. He had no difficulty in seeing objects and the letters. He of course could not understand what was printed or written. His writing is shown in Fig. 3. When asked to write his name, it will be seen that *hom* can be made out in the word which is meant for "Thomas." When asked to copy "*to dog,*" written in manuscript letters, a slight resemblance can be seen in the *d* and the *o* in dog. Asked to copy print, "to dot," the *o* in "to" is copied, and the *o* in "dot," whilst an attempt at *d* looks more like a *b*. On the other hand, he writes to dictation better. Asked to write "dog, mad, cat," he wrote *dog*, *mad*, and for cat *aao*, but when he came to cat he seemed exhausted, which probably accounts for his not being able to write it.

Note, however, how different and hesitating in style this writing is from the specimen of his writing before his illness, shown in Fig. 1

How like the first attempts of a child learning to write! He remained in much the same condition as regards his speech troubles till a few days before the end of his life, when he became much more paralysed in his motor functions on the right side, being almost completely paralysed

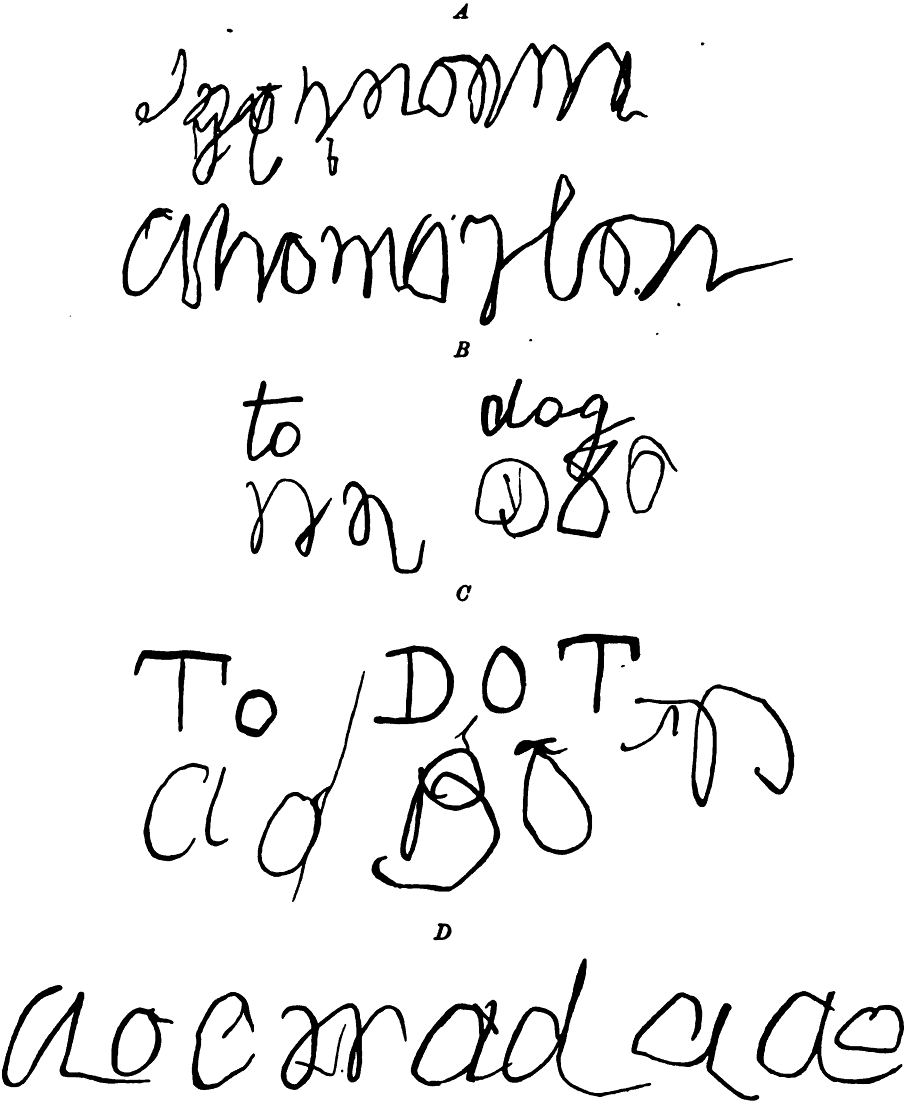


FIG. 3.—Attempts at writing by Case 1 on 2nd December. *A*, Voluntary attempt at writing name (Thomas); *B*, attempt to copy "to dog," as written above his attempt; *C*, attempt to copy "TO DOT," as printed above his attempt; *D*, attempt to write to dictation, "dog, mad, cat."

when at rest, but he was often in a condition of general twitching or clonic spasm, the movements being more marked on the right than the left side. Answering the twelve questions which I am in the habit of putting to myself in the investigation of an aphasia case, and which I have elsewhere[1] pointed out as being a great help in the diagnosis of the different varieties, we find that the following was the condition in this case :—(1) He could hear sounds. (2) He could hear words as words. (3) He could understand words heard. (4) He could see objects, etc. (5) He could not see words as words, but could see some letters. (6) He could not understand words nor letters either written or printed. (7) He could speak voluntarily. (8) He could repeat words spoken to him. (9) He could not read aloud. When he attempted doing so he spoke letters, as if spelling; sometimes, but rarely, these letters were the correct ones, and he often repeated the same letter or series of letters over and over again. (10) He could not write voluntarily except a very few familiar letters, such letters as those in his signature. (11) He could write some letters and words to dictation. (12) He could not copy intelligently, and could imperfectly do so as a tracing.

He died on the 11th December, and the post-mortem examination of the brain showed the following condition :—There was an adherence of the skull-cap to the membranes ; the dura mater was thickened and more opaque-looking than usual ; the venous sinuses were engorged with blood. Examination of the left hemisphere showed that there was a slight milkiness in the sulci and fissures, especially those towards the posterior end of the fissure of Sylvius, and behind the fissure of Rolando.

The arteries were seen to have very much thickened and atheromatous walls, so that some of them looked like white pieces of cord standing out from the surface of the pia mater. Some of these vessels looked as if they were quite solid. The veins were also much thickened. The condition is brought out well in Fig. 4.

A patch of yellow softening was seen and felt at the posterior end of the fissure of Sylvius. It was almost a circular patch, and measured fully an inch in circumference. It involved the posterior third of the supramarginal convolution and the angular gyrus, and extended from above the intraparietal fissure to a slightly lower level than the posterior end of the parallel fissure. It reached as far back as the first occipital convolution. The posterior ends of both the Sylvian and the parallel fissures were thus included in the area of softening. This softened area is shown in the illustration, Fig. 4, enclosed by a dark worsted thread. On cutting into the hemisphere at a level slightly below this softened area, it was seen to extend through the cortex and into the white substance of the hemisphere as far as the posterior horn of the lateral ventricle, which it just reached, but in passing in it got gradually narrower, being thus pyramidal in shape. The section showed the cause of the softened patch, namely, a thrombus in the Sylvian artery, beginning at the anterior border of the softened patch. The artery was quite blocked by a thrombus, and for a quarter of an inch around the vessel there was a darkish discoloration of the blood, giving an appearance of ecchymosis. The softened patch was the area supplied by the posterior terminal branch of the Sylvian artery. On examining the vessels at the base of the brain, the principal arteries, the basilar, the carotids, the middle cerebral, the anterior and posterior cerebrals, had all much thickened walls, with calcareous degeneration at many parts, the vessels being at places converted into calcareous tubes. There was a marked difference between the vessels on the left side of the brain and those of the right. At places there was atheroma on the right side also, but not nearly so marked, and the whip-cord like appearance of the vessels on the left side was not present on the right. There was no change in the internal cap-

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[1] "Aphasia and the Cerebral Speech Mechanisms," London, 1897.

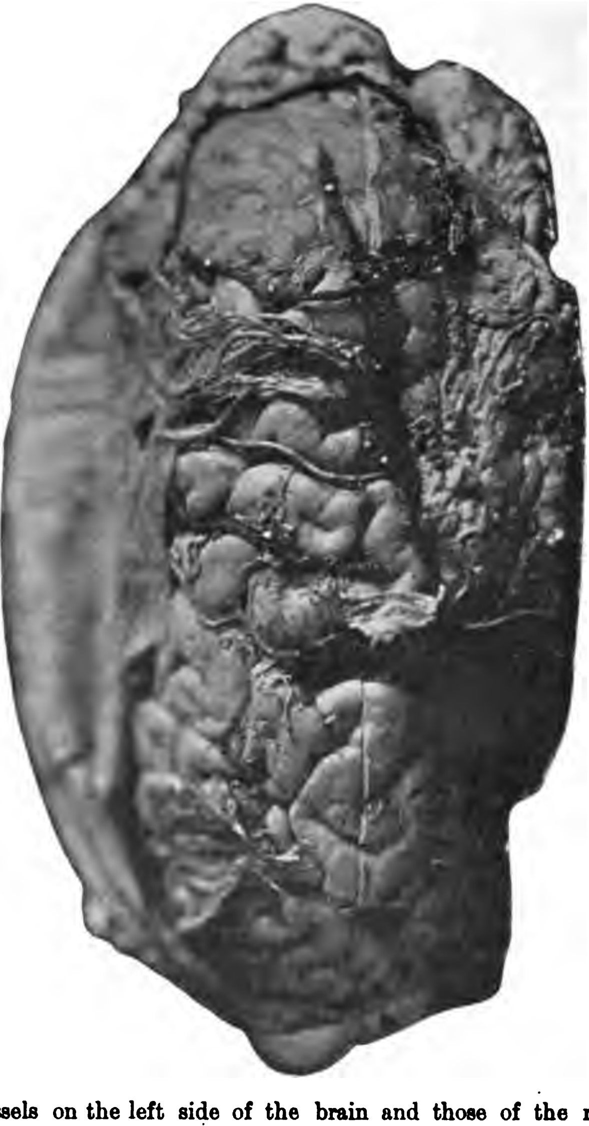

FIG. 4.—From photograph of left hemisphere of Case 1. The area of the cortex involved in the lesion is enclosed by a dark thread. Note the cord-like appearance of the arteries.

sules on either side. The convolutions anterior to the fissure of Rolando on the left side looked healthy. There was an unusual arrangement of the convolutions in the neighbourhood of Broca's convolution, an arrangement, however, not due to disease. This is brought out in the illustration (Fig. 4). There was no disease of the temporo-sphenoidal lobe.

The post-mortem was thus confirmatory of the now accepted fact that the angular gyrus is the seat of the visual word centre.

And now let me contrast this with the case of Dr. Love of Glasgow, to whose kindness and courtesy I am indebted for the notes.[1]

Case 2.—T. C., æt. about 23, became suddenly ill in the midst of perfect health, on 17th Nov. 1897. Seen by Dr. Love in a remote part of the country on 5th December; diagnosis made of sporadic case of epidemic cerebro-spinal meningitis; right-sided hemiplegia having supervened the day before he was seen; aphasia, optic neuritis, and partial deafness. Gradual improvement, so that when he was admitted into the Western Infirmary, on 19th March 1898, the condition was as follows:—

Paresis of right arm, flexors more than extensors; slight paresis of face of same side. *Leg* power at hip and knee fair, but distinct ankle-drop, gait not hemiplegic, but stepping with high action to clear toes. Foot cold and blue. Tibialis anticus and peroneal muscles markedly weak, and faradic responses extinguished in both groups, but present everywhere else. No impairment of ocular movements or of tongue. No nystagmus; pupils equal and react normally to light and on convergence. Visual acuteness unimpaired.

No hemianopsia, and fields for light and colour normal. Hemianæsthesia of right side, but not marked in extremities of limbs, feet, and hands, and extends to mucous membranes of mouth, nose, and eyes. Hypalgesia of whole of right side. Muscular sense and sense of posture profoundly affected on right side, unimpaired on left, the hand being more implicated than the leg. He cannot tell when an object is in his hand, except when he sees it, and he lets it fall when his vision is obscured. Taste and smell are normal; hearing fair on both sides. Gesture and emotional expression unimpaired. He has articulation and amnesic speech defects; voluntary speech reduced to "yes" and "no," used correctly. He can, however, tell and repeat his name; no paraphasia; no object blindness; no word-deafness. Marked letter-blindness to all letters but T, which he calls *Tom*. Can neither read nor write a single letter of the alphabet as such, nor can he point out any named letters but T, and it is found impossible to revive the memory of any of them by imparting the movements to his hand, as in writing them, or by causing him to trace his finger over written letters. He has the same loss with all sizes of letters, Roman, Gothic, capital, and small, written or printed. Can name numerals up to 9 (badly), but not further, and only the Arabic. He fails with Roman. Word-blindness only partial. He could not understand nor read the written request, "Shut your eyes," but made out eyes promptly, and articulated it well, and in very many trials at the first examination it became apparent that he could both understand, point out, and read very many words either written or printed, even very unfamiliar ones of three or four syllables, but failed to point out a single letter of any word, even one he had just named correctly. He could not spell the simplest words, nor tell nor point out the first letter. Substantives he could make out better than verbs or other words.

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[1] The case has been recorded in Hinshelwood's recently published work on letter, word, and mind blindness.

He could at this time write his name and a few other words, both spontaneously and to dictation, and he made an attempt to write a sentence to dictation, but the motor and sensory defects in his right hand formed a barrier to his holding a pen, and his mode of writing was very peculiar, being really performed by his left hand, although the pen was placed in his right, his left being superimposed on his right. He could not be got to try with his left, nor could he be got to try with the pen between the teeth. There was no amnesia. He could read and intone the signs of the new notation, although he could not name the signs as letters, only as words. He reads mirror-writing in a remarkable way. No other form of word-blindness; persons, things, pictures, colours, geometrical figures, all recognised promptly and perfectly, both by sight, touch, and smell, in the several cases.

The above was his state on admission.

He was commenced with letters in an attempt at re-education, and by 18th May (two months later), the last time he was seen by Dr. Love, his attempt at writing the alphabet spontaneously, resulted as follows:— *a b c d e i j h m n s u w v y z;* and on the following letters being dictated to him he wrote as follows:—

Dictated	b	Wrote *b.*
,,	y	,, *l.*
,,	p	Failed.
,,	r	,,
,,	c	,, *c.*
,,	f	Failed.
,,	d	,, *a.*
,,	g	,, *g.*
,,	h	Failed.
,,	k	,, *q.*
,,	h	,, *h.*
,,	l	,, *l.*
Dictated	m	Failed.
,,	o	Wrote *o.*
,,	a	,, *a.*
,,	e	Failed.
,,	j	,, *i.*
,,	n	Failed.
,,	q	,, *q.*
,,	s	Failed.
,,	r	,, *t.*
,,	v	,, *v.*
,,	w	,, *w.*

But whilst he failed with *k* he wrote "king" correctly to dictation, and so too with others, such as "pot, Robert, fox, man, dog, nail, egg, sun." On 2nd May he wrote spontaneously the following to his mother:—

> "DEAR MOTHER.—Please send my clothes to-morrow, and my boots, as I am getting on the grounds. I am keeping better; hoping you are all well.—I remain, yours."

The above case presents many features of very great interest, but the symptoms which I wish to draw particular attention to here are the aphasic ones.

Briefly, it may be stated that, whilst he had the greatest difficulty in reading letters, he had not nearly so much difficulty with words; he could read words, whilst he could not name the letters which composed the words. And whilst, as seen in the above letter written by him, he could write words, he had the greatest difficulty in writing single letters when dictated to him. His visual word defects were of the same character as his writing defects, although at the earlier stages of his illness the paralysis of his right hand was a barrier to the bringing of this point out, *i.e.* he read words better than letters, and he wrote words better than single letters. This, as will be seen, is a contrast to the previous case, where the patient persistently read all words as letters, his reading sounding to a listener as if he was spelling. The cases, however, are not quite the opposite condition to each other, because, although Case 1 apparently spelled, on closer investigation it was found that he could not invariably read letters correctly. He certainly could read letters better than even small words, and only a few small words could be read by him, but he made many mistakes in the letters, just as Case 2 could not read all words, but still seems to have been more able to read words than Case 1 could read letters; and conversely—Case 2 had greater difficulty with the letters than Case 1 had with the words. The one case seems to have been a more complete case of pictorial visual aphasia than the other, but what escaped obliteration in the one case seemed to have been entirely obliterated in the other; and what was most completely obliterated in the one case almost escaped in the other. What I have already said as to method and manner of education may, however, in part at least, explain the difference between the two cases.

The powers of writing in the two cases bore a distinct relation to the powers of reading, a condition almost invariably present in cases of *pictorial* visual aphasia. In infra-pictorial visual aphasia, on the other hand, there is an enormous difference between the ability the patient possesses of reading, and the ability to write, as is brought out by Case 3, which, as a contrast to Case 2, is even more complete than Case 1.

The case was published by me elsewhere.[1]

CASE 3.—*Infra-pictorial visual aphasia* (*cécité verbale pure*)*; word-blindness, but not blindness for letters or figures; ability to write spontaneously, but inability to read what she had written; very slight and temporary disturbance of the object-seeing faculty; mind-blindness; rapid and complete recovery.*—M. P. æt. 67, was engaged, one day in March 1892, writing a letter to a friend, when she suddenly discovered that she could not see the words distinctly, and that after she wrote a sentence she could not see what she had written. She thought that she was losing her eyesight, and consulted me about it. Her only other complaint was that she had difficulty in recalling proper names and nouns, as well as slight impairment of her memory for events. The friend to whom she had written, on receiving her letter, wrote back and asked her what was wrong with her, as she had repeated some sentences and words in the letter. Shortly before writing this letter, on her servant, who had been with her for some time, coming into the room, she turned to a friend and asked "what strange woman that was." In a few minutes, however, she was able to recognise the servant and every other object about her, and never had a return of this. On testing her eyesight, I found that she could see objects quite well, that she saw letters well, and could name them slowly, but that she could not put them into words. When, however, I spelt short words aloud for her, she could pronounce the word from the sound, but often in a slow and disjointed manner. She herself could read in this way, namely, by reading the letters aloud and pronouncing the word from the sound of the letters, but this could only be done with the smaller words. She could write voluntarily, but she could not read what she had written, although she could make out the letters and figures. She was not tested as to copying or writing to dictation. She could hear quite well, and could converse quite well, so that there was no impairment of her auditory or motor word centres. These symptoms persisted for two or three days, and then they gradually passed off, so that in three weeks she had quite recovered, except that her memory was slightly impaired for a little longer period. She is now, seven years afterwards, in fair good health, and has had no return of her complaint. The answers to the twelve questions would be the following:—(1) She could hear sounds. (2) She could hear words spoken. (3) She could understand words spoken. (4) She could see objects, etc. (5) She could not see words (as words), written or printed, but she could see letters. (6) She could not understand words written or printed. (7) She could speak voluntarily. (8) She could repeat words spoken. (9) She could not read words aloud (she could read letters). (10) She could write voluntarily. (11) Probably she could write to dictation (but not tested). (12) She could probably copy as a drawing.

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[1] "Aphasia and the Cerebral Speech Mechanism," 1897, p. 158.

The most outstanding difference between this case and the two previous ones is the fact that the patient could write voluntarily quite well, although she could not read what she had written. Her powers of writing, indeed, were so well retained, that when she first noticed there was something wrong she had actually been writing a letter, and could not read it after it was written, although there is evidence in the slight mind-blindness that her trouble had come on before this. In other respects the case more closely resembles Case 1, in that although she could not read words she could read letters and figures. Case 2 showed, as above stated, quite the opposite condition, namely, blindness to letters but not to words. We have therefore, in these three cases, the following gradation of blindness:—(1) Blindness for letters, but not for words and sentences, Case 2. (2) Blindness for words and sentences, but not for letters, Case 3. (3) Blindness almost complete for words, letters, and sentences, Case 1.

To complete the picture, the following case showed blindness for sentences, but not for words nor letters. The case will be found recorded at page 173 of my work on aphasia. It was, I believe, a case of the supra-pictorial variety of visual aphasia, a form that I have not seen previously recorded. It is specially interesting here, when placed alongside these other clinical varieties of visual aphasia.

CASE 4.—*Hemiplegia; supra-pictorial, visual aphasia: agraphia.*—

E. H., æt. 67, was seized in the summer of 1896 with slight difficulty in speaking, with weakness of the right arm and leg. For some months previously he had been treated for weak and irregular action of the heart. The hemiplegic symptoms, although they began suddenly, progressed slowly for a month or six weeks, when he had lost almost entirely the use of his right arm and leg. His difficulty in speaking, however, rather improved. He had no true motor aphasia, the difficulty in speaking being due to dysarthria. His intelligence, which was slightly dulled at first, gradually improved, and about two months after the onset he was perfectly intelligent, and took a great interest in his business and all around him. He found, however, that whilst he could understand perfectly what was read and spoken to him, he himself could not intelligently read a book.

He said to his wife one day: "It is very curious that, whilst I can understand what you read and can remember it well, I cannot understand what I read myself. I see everything quite well, and can see the words and can pronounce the words aloud, but I cannot connect them into sentences." On being tested, it was found that practically his statement was correct. He could read letters, figures, and words, although he spoke them a little more slowly than one usually reads.

Occasionally, with a long word, he would make a mistake in a syllable, substituting some other syllable in the middle for the proper one; but he usually could correct himself. For instance, he was asked to read aloud the following sentence from a paper:—"Shires and Clydesdales. Some few weeks ago, in commenting—" He first read, *Shires—and—Clydesdales. Some—few—weeks—ago—in—commuting—*; then he looked at the last word again, and, after two attempts, he said *commenting*. In reading he heard what he himself said, and understood it. He could thus read slowly and understand what he read, but the understanding of sentences was done entirely through the ears.

He could spell words when asked to with the greatest ease, and when a word was spelt over to him he could tell what it was at once. He had very slight dysarthria in speaking.

On testing his powers of writing, it was found that he was absolutely agraphic. His right hand was paralysed, and so could not be tested; but when asked to write his name with his left hand, he took the pencil and was about to begin doing so, when he suddenly found that he could not, and said so. He could not write a single letter of the alphabet. He was then asked to trace an A in the air with his left forefinger or hand, and he could not do so, to his great surprise. Similarly, with other letters, he could apparently not recall their shapes.

The patient remained in much the same condition till shortly before his death, early in 1897. No post-mortem examination was made.

This last case is an unusual one, and there may be differences of opinion as to the seat of the lesion, but, as a contrast to the other cases, it is interesting. It is perhaps scarcely right to put sentence-blindness on the same level as word- and letter-blindness, because of the rarity of the ability to read by sentences, as I previously pointed out. This case could understand what was read to him and spoken to him, and yet, although he could read letters and words, he could not understand the meaning of the sentence of which they formed a part. The only explanation of this case to my mind is, that there was an interruption in the communication between the word-seeing centre and the higher associated centres, or between the word-seeing centre and the auditory word centre, whilst the auditory word centre and its higher associations were intact.

In this article I have not considered mind-blindness nor object-blindness, which are also varieties of visual aphasia, nor have I specially referred to disorganisation of the specialised visual centres, other than those connected with the speech faculty —such as visual amusia, etc.

These specialised centres are liable to disturbances of a kindred nature to those affecting the word and letter centres, and the symptoms are liable to vary in different cases, according to the seat of the lesion, the sensorial aptitude of the individual, and the method and degree of education of the special centres affected.

SOME PRACTICAL OBSERVATIONS ON 'THE EARLY DIAGNOSIS OF CANCER OF THE STOMACH.

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Most of us, I fancy, will be disposed to agree that there are two diseases in particular where early and certain diagnosis is of special importance. I refer to phthisis pulmonalis and cancer. In the former we may hope to greatly benefit, even to cure the patient, by putting him under such favourable natural conditions that the *Bacillus tuberculosis* can make no fresh inroads on his lung tissue, and may finally be disposed of altogether; while in cancer we are face to face with a disease which can be eradicated by no other known means than the knife, and then only if it is dealt with in a very early stage of its progress. I do not mean by this to say that a well-developed scirrhus of the mamma may not be removed without recurrence; but, speaking generally, if the victim of cancer is to have any chance at all, he must be submitted early to operation.

Now, in the great majority of instances, the task of making an early diagnosis devolves upon the shoulders of the general practitioner, and we are therefore bound to make use of every possible means of enlightenment when such a momentous issue is at stake. A medical man may make an erroneous diagnosis between chronic rheumatism and chronic gout, without any harm resulting to his patient; he may pronounce a man to have chronic bronchitis and overlook an accompanying emphysema, without subjecting his patient to any special risks, or bringing discredit on his own powers; but the overlooking of a malignant tumour, or the failure to diagnose the same, may be fraught with the most grave consequences to the sufferer, and may subject the unfortunate practitioner (as it has done before now) to bitter recrimination and reproach from the patient or his friends.

Apart from the general practitioner, it is the physician rather than the surgeon who is the more likely to see cases of gastric cancer in an early stage of their life-history, and it is to this form of malignant disease that I desire to direct attention, with special reference to the question of making an early diagnosis.

A very general feeling exists, in spite of Dr. Newsholme's assurances to the contrary, that cancer is increasing in this country, and personally I lean to that opinion. Against this, it it alleged that the increase is only apparent, not real, owing to more exactness in death certification, greater skill in diagnosis, and more frequent confirmation of opinion by post-mortem examination; and also to the fact that, with a lessening infantile and child mortality, more persons live to the cancerous age, *e.g.* from 40 to 60 years, and that therefore there are more deaths per million of the living population from this cause. But, allowing for all this, the conviction is borne in upon one, and is supported by facts, that cancer is actually increasing as a cause of death, and cancer of the stomach takes a leading place in this connection.

That being so, we are not likely, under any circumstances, to have diminished facilities for seeing this class of ailment, and it therefore behoves us to avail ourselves of all the means within our reach to make our diagnosis here very early, for it is only by doing so that we can offer the patient any degree of hope from surgical interference, at least as far as radical care is concerned. Mayo Robson, in his recently delivered Hunterian Lectures on the "Surgery of the Stomach," says that "cancer of the stomach *quâ* cancer is more favourable for radical treatment than cancer of the breast or of the tongue"; and he also insists on the fact that the earlier these cases are seen by the surgeon the greater chance there is of *real good* being done. I emphasize these words, meaning by them a radical cure, for in many cases where surgical treatment is adopted it is found that the disease is too far advanced for anything but a gastrostomy to prevent the patient dying of starvation. He will, of course, although temporarily relieved, die eventually (usually within a year) of local spread of, or metatases from, the primary tumour.

In considering in detail the early diagnosis of cancer of the stomach, we may marshal our facts under three heads—(1) The etiological factor; (2) the symptomatic factor; and (3) the objective signs or physical diagnosis.

1. **The Etiological Factor.**—Under this we may consider various points, such as age, sex, pre-existing stomach disease, habits regarding food and drink, occupation, and so forth. As a matter of fact, we gain little positive helpful information from the etiological factor. Males are certainly attacked more frequently than females, various authorities giving such ratios as 5 to 1, 2 to 1, 5 to 4, and so on. In general, the subjects of cancer of the stomach are men at least twice as often as they are women.

The great majority of cases occur in persons between 40 and 60 years of age. Of the last ten cases I have personally observed, nine were within these age-limits, and of the total number seven were males and three females. No doubt cancer of the stomach does occur at earlier ages, but it does not appear to do so as frequently as does malignant disease of the uterus, for example.

With reference to pre-existing disease of the stomach, it is the exception rather than the rule to meet with this. It is believed that a small percentage of cases of gastric ulcer eventually show malignant degeneration, and I saw a very typical instance of this lately, where the autopsy revealed the presence of a deep, well-formed gastric ulcer, surrounded by a ring of dense malignant infiltration, but there is little to support the idea that there is any causal connection between the two conditions. Again, subjects of gastric cancer may certainly show evidence of associated gastric catarrh, but, as a rule, there is not a history pointing to the continued presence of the latter before the characteristic symptoms of cancer appear.

Can we ascribe the development of malignant disease of the stomach directly to food errors? This must, I think, be answered in the negative. Dietetic faults are certainly potent in determining the onset and fostering the progress of such stomach diseases as gastric catarrh, gastric ulcer, and dilatation, but, as I have pointed out, cancer of the stomach does not, as a rule, follow other diseases of that viscus, and it has not been found possible to ascribe it directly to any particular article of food or mode of living. While referring to the question of feeding, it is interesting to note that Sir William Banks, in the Lettsomian Lectures of this year, is very strongly of opinion that the increase of cancer in this country is due to the large quantity of nourishing and stimulating food consumed by so large a proportion of the community. He adduces various interesting arguments in support of what he calls the "over-nutrition" theory of cancer, pointing out, among other things, that those showing the highest mortality rates for this disease are such persons as commercial travellers, coachmen, butchers, innkeepers, brewers, etc.—precisely the class of persons who, as a rule, eat too much and take little exercise. This general statement applies, of course, to cancer in all localities, the stomach merely sharing with the other organs in the general proclivity.

On the whole, then, little information of real clinical value can be gained from what we may call the etiological factor.

2. THE SYMPTOMATIC FACTOR.—The symptoms of malignant disease of the stomach vary considerably, very much more so than when the organ is the seat of an ulcer. In general, the patient, on seeking advice, states that for some weeks (or more frequently months) past he has suffered from *dyspepsia*, characterised by uneasiness after eating, acidity, eructations, and subsequently *vomiting*. He states that the vomiting did not relieve the stomach in the way he had hoped it might. As time proceeded, he felt, not only uneasiness, but *pain*, of a gnawing, dragging description, sometimes referred directly to the stomach, sometimes radiating towards the back. The vomiting meanwhile continued, occurring not only after, but between, meals, and he notes that the vomited matter, which at first consisted of partially digested food, presented one day a peculiar brown and grumous appearance. This was the first indication of *hæmorrhage*, and it is worth while bearing in mind two points in this connection—(1) That in most cases of cancer of the stomach, vomiting exists for some time before any blood is observed in the vomitus; and (2) that the bleeding is, as a rule, scanty (as if a slow oozing took place from the mucosa), and the blood much altered in colour and appearance. Later on, it may happen that our patient notices a further change in the material vomited. He finds that the stomach does not empty itself so frequently, but that, when it does reject its contents, much larger quantities are brought up than in the earlier weeks or months of his illness, and the vomited matter is largely fluid, has a sour smell and a yeasty appearance. This indicates that malignant stricture has taken place at the pylorus, and that gastri-ectasis (or dilatation) has subsequently ensued.

Meantime the pain has continued with greater or less severity, being aggravated by the ingestion of food; but we find that very soon the desire for food leaves the patient, and so *anorexia* becomes a distinct symptom. Thirst may be present or not; it is usually most marked where dilatation and fermentation occur. On making inquiries regarding the bowels, it is found that *constipation* is present in a very distinct degree.

There is one very striking symptom which has occasioned the patient more uneasiness of mind than his gastric sensations (at least in the early stages of the disease), and that is a progressive and serious *loss of weight* with accompanying *failure of strength.* A man with cancer of the stomach can easily drop 3 stones in three months; and so striking is this feature of the disease, that one should always suspect malignant disease when a man of say 50 or 60 years complains of this, and of associated symptoms of dyspepsia. There is probably no other form of cancer where emaciation is so striking as in cancer of the stomach, even while the patient is still taking a reasonable amount of food, not suffering much pain, and not bleeding from the organ.

The loss of energy and the feeling of general weakness are proportionate to the emaciation.

In summarising the leading symptomatic indications, we may note that—(1) Nausea, feeble digestion, and vomiting generally precede hæmatemesis. (2) Pain is often present early, is frequently constant in character, is aggravated by the ingestion of food, and is not relieved by vomiting. (3) Loss of flesh, with concomitant loss of bodily vigour, often forms an early and striking symptom. (4) Hæmorrhage, when it does occur, is usually scanty and irregular, and the blood is much altered. (5) Appetite rapidly fails, the patient often losing all desire for food, and showing no sense of hunger, such as is present so frequently in gastric ulcer, where the patient wishes to eat but fears to do so.

3. The Physical Examination.—(*a*) Before proceeding to local examination, it is well to consider the general appearance of the patient. I have already referred to the early emaciation which accompanies the loss of energy, but in addition to this there is often a striking alteration in the colour of the skin. At first the complexion is sallow or dark; later on a pallor becomes blended with this, so that the skin is of a whitish yellow or lemon tint. This is frequently observed, and often leads one to suspect the possibility of pernicious anæmia. The cachectic state is one usually present in gastric cancer; one may see a ruddy and well-nourished woman with a mammary scirrhus of considerable size, but in malignant disease of the stomach we almost invariably find distinct evidence of the deterioration of the blood. Not only is there cachexia, but there is, as a part of it, a notable anæmia. The red cells may be reduced to 3,000,000 per c.mm. or below this, the hæmoglobin to 25–30 per cent., while the leucocytes show a normal count, or may be increased. Cabot states that a leucocytosis is usual in cancer of the stomach, and absent in gastric catarrh, ulcer, and dilatation. But in ten cases examined lately I only found the leucocytes increased in four, the average counts, while fasting, being 11,000, 11,100, 11,520, and 18,000 per c.mm.

Schneyer a few years ago called attention to the fact that the normal digestion leucocytosis which occurs in health was very frequently absent in cancer of the stomach, and suggested that this might be made use of in the diagnosis of doubtful cases. Acting on this, Hartung investigated this point in ten cases, and states he got positive results in all, *i.e.* that no leucocytosis occurred two to three hours after a proteid meal, where the patient suffered from gastric cancer. I made observations on this point in nine cases, and found no digestion leucocytosis in five, while it was found in a more or less distinct degree in four. It is to be feared, therefore, that no positive reliance can be placed on this, although a case showing absence of the leucocytosis in conjunction with other indications might lead us to suspect the presence of malignant disease.

(*b*) *Local examination of the abdomen.*—(1) *Inspection.*—If a tumour be so distinct that it can be observed as a prominence in the epigastric or hypochondriac regions, then it is well past the early stages of its evolution, and can be still more rapidly detected by palpation. But there is one phenomenon which can be detected by the eye, and which may at once arouse in our minds the suspicion that all is not right—I refer to the presence of the peristaltic wave. It may evince itself in a rippling movement, travelling across the epigastrium from left to right; or the stomach as a whole may suddenly grow prominent and tense, projecting forwards against the anterior parietes, so that its contour becomes clearly visible. The presence of peristalsis is always most noticeable in pyloric cancer, and may afford a valuable clue to the nature of the case. I saw a striking example of this about eighteen months ago, in the case of a patient who showed peristaltic movement in a distinct degree weeks before it was possible to pronounce an opinion positively as to the presence of a tumour.

(2) *Palpation.*—Of all the usual methods of clinical examination, this is the most reliable in this particular class of cases. The patient should always lie in the dorsal position, with the knees flexed, the shoulders slightly raised, and the mouth open. Examination must be conducted systematically all over the abdomen, both with the hand laid flat on the surface, and by the method termed "dipping." In the latter, the great point aimed at is to take the abdominal walls by surprise as it were, and so to bring the finger-tips against any subjacent hard structure before the muscles have time to contract. It is by the process of "dipping," too, that one ascertains the presence of fluid in a dilated stomach.

In connection with palpation, we all know how apt we are to fancy we detect a tumour deep, let us say, in the right hypochondrium, because we fancy we ought to feel one there. Even when we cannot persuade ourselves that we do feel a tumour, we are only too ready to murmur something about "an ill-defined resistance." There is no doubt that the tonicity of the recti abdominalis may make a satisfactory examination almost impossible, and therefore I would urge that in all cases of doubt the patient should be anæsthetised and properly examined once for all. Scirrhus of the pylorus, the commonest tumour found, may evidence itself as an egg-shaped, round, or sausage-like mass, in varying positions. Sometimes it lies high up, close under the costal margin; in other cases it may be situated several inches lower down. The long axis of the mass may be directed vertically, horizontally, or transversely. This refers specially to pyloric tumours; if the neoplasm be in the body of the stomach or towards the cardia, it usually feels smooth, firm, and rounded, and if of any size, may readily be confounded with an enlarged spleen. Cancer of the cardiac orifice of the gullet lies too deep and too much under the costal cartilages to admit of palpation, unless it be grossly large.

One word of caution with reference to palpation. In every instance the greatest care should be taken that the bowels have been well emptied. I have on more than one occasion palpated a fæcal mass in the upper part of the abdomen, which had all the characteristics of a tumour, and this even after a purge had been administered and had had due effect. What I wish to draw attention to is, that these hard cylindroid accumulations sometimes resist the effect of one good aperient dose, and the physician should exercise caution, and satisfy himself that the intestinal tract is really empty before coming to a decision.

(3) *Percussion.*—This is of little avail in the early diagnosis of a tumour, for the latter can generally be detected by the finger-tips before any alteration of the percussion note is apparent. It may occasionally be of value in cases where one suspects malignant disease of the cardiac orifice of the stomach; under such circumstances, where palpation cannot be utilised, an impairment of the note over the lower part of the sternum, and especially close to the left border, may suggest the presence of a tumour.

(4) *Auscultation and auscultatory percussion.*—The former is of little use here; the latter is helpful as a means of mapping out the stomach, though it can give little positive information regarding a cancerous growth. It is most easily performed by placing a stethoscope (with a fairly long stem) just to the left side of the ensiform cartilage, where it is practically certain to lie over the stomach, and, while the ear is applied to it, performing gentle percussion in a radiating manner from the instrument outwards. The change of note, as we pass from stomach to colon, etc., enables us to map out the organ with considerable accuracy. The stomach is usually of about normal size in pyloric cancer till dilatation begins, is normal or slightly enlarged in cancer of the body, and is shrunken in malignant stricture at the œsophageal orifice.

(*c*) *Chemical examination of the stomach contents.*—In all doubtful cases this should be made a part of routine work; we may on occasion utilise vomited matter for this purpose, or, better still, may withdraw the stomach contents by the syphon tube, one hour after a simple test-meal, such as a couple of ounces of bread and a glass of water. If digestion is still fairly good, a meal of meat, bread, and water may be given, and the stomach emptied two and a half hours thereafter. Almost all clinicians agree that in the large majority of cases of cancer of the stomach, free hydrochloric acid is absent a couple of hours after a test-meal, while in many cases it is found that lactic acid has taken its place. It is to be remarked, however, that lactic acid is not itself an indication of malignant disease; its presence is simply determined by the absence of the hydrochloric acid, and consequent loss of the antiseptic power of the latter. The following results, reproduced from an already published paper, indicate the kind of information that may be gained. No. 1 was a case of cancer with no dilatation (very low acidity and no free HCl); No. 2 was a case of cancer *plus* dilatation (high acidity, no free HCl, but organic acids present); No. 3 was a patient with bacterial fermentation, and no malignant disease (full acidity, free HCl present, and also organic acids). Cases 1 and 2 died shortly after this examination:—

1898.	No. 1—6th May. Cancer.	No. 2—21st May. Cancer.	No. 3—27th June. Dilatation.
Reaction . . .	Reacts slightly to litmus; negative to Congo-red.	Reacts to litmus and Congo-red.	Reacts to litmus and Congo-red.
Total acidity . .	·029 per cent.	·375 per cent.	·365 per cent.
Free HCl . . .	Absent.	Absent.	Present (distinct).
Lactic acid . . .	Do.	Present (distinct).	Present.
Volatile organic acid	Do.	Present (butyric).	Present (a trace).
Peptones . . .	Present (scanty).	Present.	Present.
Sugar	Present.	Do.	Present (a trace).
Starch	Absent.	Do.	Absent.
Blood	Do.	Absent.	Do.
Bile	Do.	Do.	Do.
Pepsin	Feeble in action.	Absent or inactive.	Feeble in action.

(*d*) In conclusion, if the physician find that a stomach case is not improving under general medicinal and dietetic treatment, and if the symptoms be such as to awaken a grave suspicion of malignancy, while at the same time it is not possible to make a positive diagnosis, I think he should call the surgeon to his aid, and seek for enlightenment by an exploratory incision. At the Edinburgh Meeting of the British Medical Association, Dr. Crawford Renton laid special stress on this point, and, while deprecating the careless use of this procedure, emphasized its value in doubtful cases. As he remarked, two good results may follow: either the surgeon does discover a tumour which may be amenable to operative treatment, curative or palliative; or else it may happen that nothing positive is discovered, and yet in some inexplicable way the simple making of an incision produces, as Dr. Renton terms it, "some change of government," and the patient finds that his symptoms are relieved. In all cases, if any hope is to be held out to the subject of cancer of the stomach, surgical interference must take place early, and if the physician fail to make a certain diagnosis, after using the means I have indicated, the state of affairs should be clearly laid before the patient, and, his consent having been obtained, the surgeon ought to be called to our help, with powers granted him to deal as he considers best with whatever condition may present itself.

(Most of the cases referred to were studied in the Western Infirmary, where, through the kindness of Dr. Finlayson, opportunities were readily accorded me for this purpose.)

OBSERVATIONS ON THE EXCRETION OF NITROGEN IN RHEUMATOID ARTHRITIS.[1]

By WILLIAM BAIN, M.D., M.R.C.P., *Harrogate.*

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RECORDED observations on the excretion of the nitrogenous waste products in rheumatoid arthritis are very few in number. I have been unable to trace more than two references. Dr. Archibald Garrod, in his treatise on rheumatism, states that Angel Money has observed excessive variations in the amount of urea and uric acid excreted, and also that Drachmann has noted a diminution in the amount of phosphates; and, secondly, von Jaksch makes a general statement to the effect that uric acid is diminished in chronic arthritis. With the hope of adding to our scanty knowledge, I have examined the urine of the following case of rheumatoid arthritis, and must thank Dr. Barrs for affording me the opportunity of doing so.

CASE 1.—G. S., a labourer, æt. 27, was readmitted into the Leeds General Infirmary on 25th September 1899. He was a small, delicate-looking man, with the following past history. Seven years previously he had injured his right knee, recovery ensuing within a month; nevertheless he ascribed his immediate condition to that injury. Two years later the other knee became painful, and gradually increased in size. Four years subsequently he was an in-patient under Dr. Barrs, when both knees were found to be affected, the right more than the left. On readmission at the time of observation, his condition was as follows:—The temporo-maxillary joint was slightly affected. Both ankle-joints were enlarged, the malleoli being chiefly affected, and movement was curtailed. The bases of the first and second metatarsal bones of right foot were thickened. Both knee-joints were very much enlarged, especially the internal condyles of the femurs. In the right, fluctuation could be detected, and there was distinct lipping of the femur and patella. There was considerable wasting of muscles, the extensors of the knee being apparently more atrophied than the flexors. The right great trochanter was enlarged, the left less markedly. In the hands there was some basal enlargement of all the middle phalanges. Marked wasting of the interossei muscles was noticeable, with ulnar deviation of the digits. Finally, both wrists, both elbows, and the spinous processes of the lumbar and lower dorsal vertebræ, were involved.

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[1] This paper was read at a meeting of the London Pathological Society.

The urine was acid in reaction, and free from albumin and albumose. The analysis of the urine included the determination of the total daily execretion of urea, uric acid, phosphorus pentoxide, ammonia, purin bases, and lactic acid.

Method of analysis.—The urea was estimated by the hypobromite method and uric acid, both by Hopkins' and Salkowki's processes. Schlösing's method was adopted for ammonia, and titration by uranium nitrate for P_2O_5. The alloxur bases were estimated by Salkowski's recent method, described in this Journal last year.[1] In estimating lactic acid, the urine was acidulated with sulphuric acid and then precipitated by barium hydrate. The baryta was precipitated by passing a stream of carbonic acid gas through the solution, which was then filtered, and the filtrate evaporated to a thin syrup over a water bath, the temperature of the bath not exceeding 70° C. About ten volumes of alcohol were gradually added to the syrupy fluid and then evaporated. This was repeated, and afterwards phosphoric acid added to the residue, which was then extracted for twenty-four hours with an excess of ether in Schwartz's apparatus. The ethereal solution having been evaporated, a watery solution of the residue was obtained, which was then submitted to Uffelmann's test.

The patient was on the following diet for three days before beginning the examination of the urine:—

Tea, 2 pints; bread and butter, 8 oz.; milk, 1 pint. Dinner, 1½ lb., including 4 oz. meat.

The results obtained by the methods mentioned are here tabulated:—

Table showing the Analytical Details of the Urine in the Twenty-four Hours.

Date.	Total Quantity in c.c.	Urea in Grms.	Uric Acid in Grms.	P_2O_5 in Grms.	Alloxur Bases in Grms.	Ammonia in Grms.	Lactic Acid.
October 21 .	1185	19·70	0·228	0·858	0·027	0·386	...
,, 22 .	1040	20·80	0·236	0·926	0·029	0·300	...
,, 23 .	1495	20·96	0·294	1·04	0·031	0·430	Absent.
,, 24 .	1300	18·2	0·234	0·912	0·044	0·265	Absent.
,, 25 .	1150	16·675	0·247	0·940	0·037	0·275	Absent.
,, 26 .	1140	18·24	0·371	1·25	0·041	0·310	...
,, 27 .	1340	17·42	0·256	0·977	0·028	0·810	Absent.
Averages . .	1235	18·856	0·266	0·986	0·033	0·397	...

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[1] *Edin. Med. Journ.*, 1899, vol. vi. p. 334.

There are two points in the history of this case to which reference may be made. The first is the possibility of a causative relation between the injury and the disease. As a rule, the influence of injury is more marked in the localised than in the polyarticular variety of the affection; and, further, the injured joint is usually the part where the disease first manifests itself. In this case the opposite knee was primarily involved. If there is any etiological connection, it is difficult in the case under consideration to understand the sequence of events, except on the hypothesis that the remote effect resulted from nervous perturbation. Such a supposition is not necessarily antagonistic to the theory of a microbic origin. The second point is the effusion which was noticed in the right knee-joint. Some authorities, Senator for instance, affirm that the fluid contents of the articular are never increased, but almost always diminished. This is a matter with regard to which most English and Continental authorities are at variance.

Regarding the examination of the urine, there was a diminution in the excretion of uric acid and P_2O_5. It is stated that in healthy individuals the excretion of uric acid varies from 0·3 to 1·2 grm. Although I have examined the urine of a moderately large number of healthy people, I have never met with an excretion below 0·4 grm. The normal relationship between the uric acid and alloxur bases was not disturbed.

As to the phosphates, they are reported to vary in health between wide limits, namely, from 1 to 8 grms. It will be noted that the minimum was slightly exceeded, and, as a further point of interest, that the slight variation in their excretion closely followed that of the uric acid.

OPTIC NEURITIS IN CHILDREN: A CLINICAL NOTE.

By Leslie Buchanan, M.B., *Assistant Surgeon and Pathologist, Glasgow Eye Infirmary.*

For a few years past the writer's attention has been specially drawn to the subject of optic neuritis, present or past, in children. Several cases have been seen, especially in the course of private work, in which a child, showing no evidence of present bad health, suffers from atrophy of the optic nerves; or, again, in which a child, with but slight signs of disease, has moderately acute optic neuritis. This was rather puzzling at first; but soon it was noticed that almost all such cases showed more or less marked enlargement of the cervical glands, which fact acted as an indication.

The writer has now seen so many cases of children and young people in whom optic neuritis, present or past, is associated with enlargement of the cervical glands, that he has thought it a fit subject for brief consideration.

In the first place, it may be said that the optic neuritis here indicated must be distinguished from that seen in cases in which there are refractive errors uncorrected.

In the cases at present under consideration, the change is a distinct optic neuritis, not, as in those of refractive type, a chronic congestion with, it may be, a certain amount of œdema and perivascular exudation; the nerve is almost invariably enlarged, and when it atrophies, it leaves not a small, but a large white nerve.

In children optic neuritis is not at all common; but it may follow several conditions without being observed, such as the exanthemata, acute rheumatism, etc. Probably the disease, however, in which the change is most frequently looked for and found, is meningitis of tubercular origin.

Now, as regards the enlargement of the cervical glands, it is not contended that all such enlargements are of tubercular origin, though many may be so. Nicoll,[1] for instance, who investigated the subject, says that "80 per cent. of all cases of enlarged glands in the neck, due to naso-pharyngeal mischief, are, or are likely to become, tubercular."

In hospital practice we see large numbers of cases of conjunctivitis and keratitis with enlarged glands in the neck, thickened lips, etc., and we have no hesitation in saying of them "tubercular." But although in many of these cases it is probable that the bacillus of tuberculosis would not be found if looked for, still one does not err much in associating them with the development of slow bone disease, etc., even though no such lesion is at present manifest. Nicoll's statement, above quoted, has remained uncontroverted, and indeed the opinion of most authorities goes to show that, even if the percentage quoted be too high, a very large preponderance of such enlarged glands are either tubercular or pretubercular in origin.

Putting the two facts together, then, the writer has come to the conclusion that it is reasonable to assume that, in many of the cases under consideration, the cause of the neuritis has been, or is, meningitis, tubercular in origin and mild in type.

One can usually obtain a history of some gastric disturbance in such cases, at some prior date; and what has been looked on as an attack of "bile" may in reality have been an attack of tubercular meningitis, which, subsiding before the grave symptoms of the third stage set in, has been unrecognised.

In many cases it is the recognition of optic neuritis which enables the diagnosis to be made, so that if such cases are not carefully examined and neuritis not observed, the disease may be missed. Then, again, optic neuritis is not a late sign of meningitis, for Gowers[1] says that, although it usually comes on after the seventh day, he has seen it as early as the fifth day of the disease. It is, from this, clear that if the meningitis subsides after this date, the optic neuritis may be the only permanent change.

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[1] "Chronic Enlargement of Lymphatic Glands, with special reference to those in the Neck," Glasgow, 1895.

Henoch[2] says of tubercular meningitis that "it is one of the commonest and most fatal diseases which affect childhood"; and Gowers,[3] that optic neuritis is present in some "50 per cent. of cases, whilst in two-thirds of the remainder slighter changes will be found if looked for carefully."

We have, unfortunately, in our hospitals abundant evidence of the frequency and fatality of the disease, whilst but little is said of cases which recover. With the exception, perhaps, of Osler, all authorities are agreed that recovery is possible, and several well authenticated cases have been recorded.

In addition, however, to such evidence, which is the only proof positive, very many competent practitioners can cite cases which have shown many, if not all, the signs and symptoms of tubercular meningitis, including optic neuritis, and still have ended in recovery from that attack. It is, of course, admitted that many cases which do recover, succumb to a second attack; but this does not appear to the writer in any way to disprove the fact that cases do recover, and probably with greater frequency than is usually stated.

Bramwell, Panas, and others state that optic neuritis is present in a much greater percentage of cases of tubercular than of simple meningitis, more especially, as Knies[4] has pointed out, if there be present at the same time a solitary tubercular tumour in some part of the brain. From this it may be reasonably concluded that optic neuritis is indicative of tubercular rather than simple meningitis. But the writer in no way wishes to confine the source of irritation to meningitis, for he is well aware of the fact that Gowers[5] wrote of this subject, "The symptoms of such a (tubercular) tumour sometimes closely resemble those of tubercular meningitis, but much more frequently pass away."

The existence of miliary tubercles in the choroid coat of the eye might be looked for as a strong corroborative evidence of the existence of tubercular meningitis, were it not that they are but rarely seen, although Swanzy[6] thinks they are present in 15 per cent. of cases. Probably, however, but few will agree with this percentage.

It is to be regretted that, in such cases as are at present under consideration, the history is frequently very defective. It may be many years since the patient has been ill, and his general health may be now much improved.

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[1] "Diseases of the Nervous System," London, 1888, vol. ii. p. 305.

[2] "Lectures on Children's Diseases," London, 1889, vol. i. p. 317.

[3] "Medical Ophthalmoscopy," London, 1890.

[4] "The Eye in relation to Disease," 1895, p. 156.

[5] "Medical Ophthalmoscopy," p. 176.

[6] Norris and Oliver, "System of Diseases of the Eye," vol. iv. p. 619. See also article "Meningitis," Allbutt's "System of Medicine," vol. vii. p. 477.

In some cases seen by the writer, the child was pale and flabby, but in at least two, excepting the existence of enlargement of the lymph glands, there was nothing to indicate that the child was or had been unhealthy.

Four cases of this optic neuritis were seen which came from the coast and country; the others were from cities and towns. In three cases, at least, there was a distinct family history of tuberculosis, near relatives having died of consumption; and in two others there was a less distinct history. In three cases there was a more or less distinct history of a fall, with injury to the head, at some prior period, after which the first signs of ill-health began. The mental state has usually been good; but in one case the patient, a young man, was distinctly dull and apathetic.

As the case of this patient was of special interest, a short account of it is given.

Case 1.—G. G., æt. 18, had a fall sixteen years ago, by which his scalp was cut deeply. Bright and active before the injury, the child, after being ill and peevish for a few days, became dull, nervous, and hypersensitive, and remained so. Bodily development and mental cultivation showed no evidence of interference, other than mentioned above. The boy went to school and learnt fairly well, but never played games with boys, and always avoided noise and excitement. Two years ago he had sore eyes, which, however, left no permanent traces. A year ago or so, the patient first complained of severe headaches. Vomiting of considerable severity began soon afterwards, and these symptoms continued for three or four months, after which the sight began to deteriorate. Six months ago the sight was so bad that the patient could not read. The general state was low, and the patient was much emaciated. Four months ago the vision was probably at its worst, the patient then being unable to recognise large objects. There was never any paresis or difficulty of speech.

When seen, his vision was V.O.D. = large objects; V.O.S. = fingers at 4 ft.; O.E. = refraction normal each eye.

Optic nerves pale and clear-cut, but irregular in outline; veins large and tortuous, arteries small. There was slight haziness throughout the fundus, but no evidence of choroiditis.

Patient had very poor teeth and thick lips, slow but regular speech. The throat and nose were healthy looking. There were several moderately enlarged glands in the neck on either side. One of the patient's brothers died of consumption, and the father suffers from what was called chronic asthmatic bronchitis.

Lastly, it is interesting to note that several cases of similar nature have been recorded by Hutchinson.[1]

To sum up, then, the writer would desire to leave the impression that, unless another distinct cause can be found, if either atrophy or inflammation of both optic nerves be seen in a child or young person, the presence in the neck of enlarged glands, even of very moderate size, is an indication that there may have been, or may be, a meningitis or a tubercular growth in the brain.

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[1] *Ophth. Hosp. Rep.*, London, vols. v. and ix.

CLINICAL RECORDS.

A CASE OF TRANSVERSE MYELITIS, SHOWING AN ABNORMALITY OF THE SPINAL CORD.

By WALTER K. HUNTER, M.D., B.SC., *Assistant Physician to the Royal Infirmary, and Extra-Physician to the Royal Hospital for Sick Children, Glasgow.*

ABNORMALITIES of the spinal cord, of developmental origin, are very rare, and especially so since Van Gieson[1] has shown many of the appearances described as such to be nothing more than artefacts. And so I do not claim that the condition of the cord in the following case is due to congenital malformation, for I consider it also an artefact. But the appearances of the cord are striking, and as the case otherwise presents some points of interest, it would seem worthy to be put on record.

The case was sent to the post-mortem room as one of Landry's paralysis, and the following is a brief summary of the illness:—

J. C., æt. 45, a puddler, was admitted to the wards of the Glasgow Royal Infirmary on 17th August 1899, with paralysis in both legs and in both arms of about three days' duration. On 10th August patient had a specially hard night's work, and sweated a great deal. On rising from bed the next morning, he experienced a feeling of "needles and pins" with numbness in his toes. He went to his work, but on the way home he noted that there was some weakness about the ankles, and that the prickling sensation had extended up into the thighs. The next day, the 12th inst., patient could still walk, but on the 13th he couldn't, and on the 14th he was quite unable to move any muscle of the lower limbs. On the 13th and 14th the arms began to feel numb, and this was quickly followed by loss of power, so that on the 15th he could not move the arms at all. The paralysis was experienced first in the hands and wrists, then in the elbows, and lastly at the shoulders. Patient had made no observations as to a feeling of numbness in the trunk, and the first time he experienced any difficulty in breathing was on the day of admission.

He was admitted on the 17th inst., when there were observed to be paralysis in the arms and legs, and in the trunk up to the level of the clavicles. The paralysis in the arms was not complete, for both thumbs could still be adducted and abducted. The breathing was entirely diaphragmatic, except that the chest seemed to be moved to a slight extent by the sterno-mastoids. There was no paralysis in the muscles of the neck, face, eyeballs, or tongue.

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[1] "A Study of the Artefacts of the Nervous System," New York, 1892.

The pupil reflexes were normal. The voice was hoarse, and gradually became more so towards the end of life, when patient could neither cough nor swallow. Sensation was not markedly impaired, unless in the legs, and there only below the level of the knees. Both deep and superficial reflexes (those below the level of the clavicles) are noted to have been absent, and it is said that there was no loss of control over bladder or rectum. Patient died some forty hours after admission. The temperature at first remained normal, rising to 102° a few hours before death. The respirations ranged from 22 to 28.

At the post-mortem examination the body was noted to be that of a well-developed and well-nourished man, and, so far as external appearances went, quite free from any congenital deformity. It was permitted to examine the brain and spinal cord only. The brain and its membranes were quite normal in their naked-eye appearances. The cord was removed along with its membranes. On laying open the spinal dura, a portion of the lower dorsal cord, of about 1½ in. in length, was seen to be considerably swollen, and it was apparently in an extremely disorganised and softened condition, seeming to have the consistence of thick cream. A smaller area of the cord in the upper cervical region was also swollen, and it looked slightly softened. These softenings were very white in colour, much more so than the rest of the cord, and they were recognised by all those present at the examination as being areas of transverse myelitis. Cultures and cover-glass preparations were taken from the softened areas, and Fränkel's diplococcus was found in a practically pure state.

The cord along with its membranes was placed without further manipulation, and with every care to prevent deformity, in 10 per cent. formol. After being twenty-four hours in this solution, the cord was again examined. It was now found that at the lower end of the dorsal softening a considerable amount of the peripheral tissue had disappeared, giving the cord at this point a constricted appearance, but the upper part of the softening remained the same as before. The constriction was doubtless the result of the very soft tissue being washed away by the fixing fluid.

Transverse incisions were now made throughout the whole length of the cord. On reaching the upper part of the dorsal softening (now quite hard), there was found what seemed to be an inflammatory exudation lying to the left and slightly in front of the cord, and occupying about a half of its circumference (Fig. 8), otherwise the cord at this level looked practically normal, quite different from what one seeing it before hardening would have expected. On making serial section throughout the softened part, it was found that this so-called exudation was really an offshoot from a portion of the softening a little lower down. Fig. 1 is meant to represent this softened part in longitudinal section, and its transverse lines, *a*, *b*, *c*, *d*, *e*, *f*, *g*, indicate the levels of the transverse sections shown in Figs. 2, 3, 4, 5, 6, 7, 8. These sections were made from portions of the cord embedded in celloidin, and they were stained with (*a*) hæmatoxylin and eosin, (*b*) thionin, and (*c*) alum-carmine.

The first section (Fig. 2), taken from immediately above the narrowest part of the constriction, shows considerable loss of tissue, with distortion of the parts remaining. The right anterior horn seems more or less normal, but the left is elongated and displaced inwards, while the posterior horns seem to have become fused together. Fig. 3 is but a slight modification of Fig. 2. But in Fig. 4 the posterior horns have become separate from each other, the left posterior horn seeming to have joined the anterior horn of its own side. In Fig. 5 and the succeeding figures the distortion is but slight, and the disposition of the horns gradually assumes the normal arrangement. In Fig. 6 we have the first appearance of the offshoot or accessory portion of the cord represented in Fig. 1. Fig. 7 shows the process of separation, and Fig. 8 its complete separation. The accessory portion, it is to be noted, contains a proportion of grey matter, in shape very like an anterior horn, with attached to it a more elongated part, which might correspond to a posterior horn. But these points are sufficiently indicated in the illustrations, and require no further description. The figures were drawn by means of the camera lucida, and they may be taken to represent accurately the outlines of the sections and the disposition of the grey matter. As to the white matter, in all these sections it presented a strangely normal arrangement, there being none of the masses of displaced or distorted fibres so often seen in artefacts of the cord.

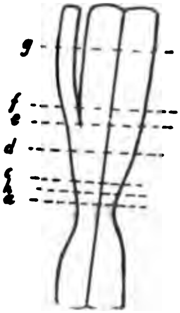

FIG. 1.

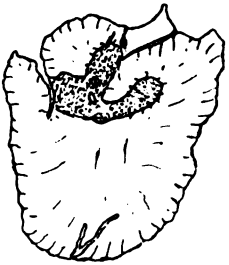

FIG. 2.

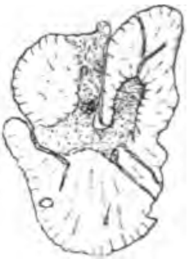

FIG. 3.

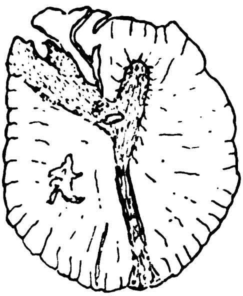

FIG. 4.

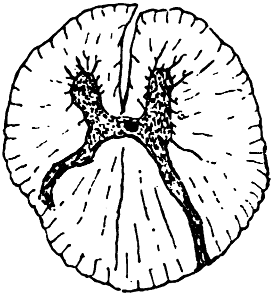

FIG. 5.

The sections through the cervical softening showed no distortion of white or grey matter and no loss of tissue.

Histological examination.—No examination was made of the cord in the fresh state; but numerous sections, fixed and stained as abovementioned, taken from all levels of the cord, were carefully examined. And the most outstanding feature of these sections, whether from the softened portions or from the rest of the cord, seemed to be the absence of abnormal histological appearances. In none of the sections was there evidence of any inflammatory process. Even in the softened portions the vessels were nowhere found congested, nor were there hæmorrhages, dilated perivascular spaces, nor exudation of leucocytes. There was no proliferation of connective tissue elements, and no increase of Deiter's cells. Any changes present were rather of the nature of degeneration and softening. Throughout the whole cord, medulla, and pons, the vessels showed well-marked colloid degeneration, and colloid bodies were likewise present, being especially abundant in the two softened areas. In neither of these areas was there evidence of definite breaking down of tissue, though in the sections through the lower part of the dorsal softening the left anterior horn (except for its ganglion cells) showed little definite structure. In the rest of the dorsal softening and in the cervical softening the axis cylinders and their myeline were in places ill-defined, and though it was difficult to make out that they were structurally altered, their staining conveyed the impression that they were at least altered in chemical composition.

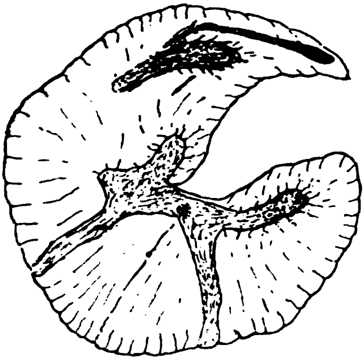

FIG. 6.

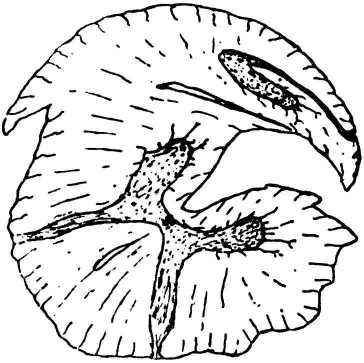

FIG. 7.

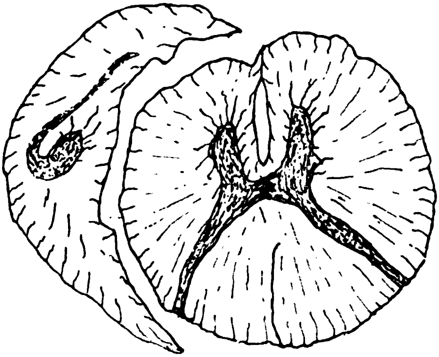

FIG. 8.

No degeneration was to be made out either in ascending or descending tracts, but it must be noted that none of the sections were stained by Marchi's method.

The ganglion cells, even in the softened areas, were little altered. In the left horn of the sections represented in Figs. 2 and 3 the cells were pale, and their Nissl bodies were somewhat broken up, approaching the appearance of the so-called "ghost cells," but the ganglion cells in the right horns in these sections showed no appearance of chromatolysis. It is to be noted that the accessory portions of grey matter, seen in the sections represented in Figs. 6, 7, and 8, also contain well-stained ganglion cells. The ganglion cells throughout the cord, medulla, pons, and cortex contained quite an unusual amount of yellow pigment. Indeed, scarce a ganglion cell was to be found without some pigment, and many were entirely filled with it. This pigment was quite as abundant in the cells of the healthy cord as in those of the softened portions.

That, then, briefly is the record of the case. And it would seem to be of interest, not only as showing an abnormality in the dorsal cord, but also from the point of view of the pathology of transverse myelitis. That the softenings in the cord were antemortem, seems undoubted. The symptoms of the case, which were typically those of transverse myelitis, seem to prove this, and the presence of Fränkel's diplococcus is further evidence. That the symptoms were due to the softenings also seems certain, for careful examination of the peripheral nerves showed very few of their fibres to have undergone degeneration—thus excluding the idea of peripheral neuritis. The softenings were evidently not the result of an inflammatory reaction, and they must have been due either to the direct action of a virulent toxine, or else to the local occlusion of blood vessels. The action of a toxine would perhaps explain the apparent disproportion between the severity of the symptoms in the arms and the slight change to be found in the cervical cord. Certainly to the naked eye there was some swelling and evident softening in the cervical region, but microscopic examination showed but little structural alteration in this softened tissue.

It is difficult to be certain of what exactly is the nature of the accessory portion in the dorsal region of the cord. But in view of the softening and general distortion of that level, and of the loss of tissue lower down, I am disposed to regard it as an artefact. The subject of post-mortem changes in the cord is one of great interest, but one which I cannot discuss in the meantime. It has been fully dealt with by Van Gieson in the paper already referred to, and those interested in the subject should make its acquaintance.

I wish, in conclusion, to acknowledge my indebtedness to Dr. Workman, pathologist to the Glasgow Royal Infirmary, who so kindly placed this case at my disposal, and by whose permission it now appears in print.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Manual of Pathology. By JOSEPH COATS, M.D., late Professor of Pathology in the University of Glasgow. Fourth Edition, revised by LEWIS R. SUTHERLAND, M.B. London: Longmans, Green, & Co. 1900.

IT is with sad interest that we take up this volume, the uncompleted revision of which constituted the last labour of a gifted and earnest worker whose genuine and kindly nature endeared him to all. Professor Coats' memory, and the reputation which previous editions of his book have had, are, however, fortunate in that the revision has been completed by a pupil who has caught the master's spirit, and to whom the lines laid down by him were familiar. This edition, therefore, presents the general plan with which those who have used the book are familiar, and, by a balancing of excision against addition, remains the same size. As in every book on the subject, which is to be of use to the student, not only are the great general processes of disease treated of, but the particular effects of these processes on the bodily organs are also detailed. While the biological questions which pathology raises are thus put in the forefront, there is combined with the scientific treatment of the subject the practical applications of the science to medicine. In this general part, the nature of disease, mistakes in development, blood diseases, disturbances of circulation, degenerations, inflammation, hypertrophy, tumour formation, the vegetable and animal parasites, and disturbances of heat regulation, are, as in the last edition, discussed. Here nearly every page bears evidence that former statements have been carefully reweighed and revised. Partly by the rearrangement of old material, largely by the introduction of new, there also appear sections treating of intoxications and the process of infection. This part of the work thus deals with very deep and difficult questions. It contains a great body of most excellent matter, constituting, as a rule, a very adequate consideration of the problems involved. With regard to some of them, recent investigations are causing pathological thought to be in a transitional stage, and on these the authors have, as a rule, perhaps rightly, followed somewhat conservative lines. What we may say with regard to certain defects must not be considered as detracting from the merits of the whole.

In looking at disease processes generally, while the pathology of the cell must always be our starting-point, yet we are beginning to know something of cellular metabolism, and thus are being led beyond morbid structure to morbid function. This growing element in pathological investigation is, we are glad to see, recognised by the introduction of the section on intoxications and disordered secretions, which might with advantage have occupied even greater space, several points, such as the relation of the disordered metabolism of nucleins to the uric acid excretion in gout, having been omitted. Such perversions of function might have been brought more into the forefront in the opening chapter on the nature of disease, and the bearing of recent physiological inquiries on such occurrences as dropsy and jaundice ought to have been recognised. In the important section on inflammation, while we are glad to find no inclination to embrace the extreme mechanical view of a recent German school, which would abolish the word from pathology, we should have liked a discussion, not only of this very suggestive position, but also of the other current theories on the subject. The way in which blood diseases are treated is rather disappointing, as, altogether apart from the intrinsic importance of these, the light which investigations regarding them is likely to shed on the physiology of the blood, and on the natural powers of resistance of the body, makes their full consideration desirable. The most recent views on the genetic relations of the white corpuscles, and on the essential pathology of the anæmias, especially of chlorosis, are not mentioned, the microscopic appearances of the blood are not fully entered into, and the whole arrangement of the subject lacks clearness. Further, neither here nor in connection with the subject of infection is the extremely important subject of leucocytosis at all adequately treated. The pathology of infection is outlined in one of the new sections, and exception might be taken to several statements, especially in connection with immunity. We cannot admit, as seems to be here hinted at, that the theory of Metchnikoff, in any of its protean forms, is capable of accounting for natural immunity. Further, acquired immunity cannot in all cases be explained by the capacity of cells to elaborate antitoxines. It is, of course, impossible to discuss the question at length in the space which the authors had at their disposal, but the question of antimicrobic action ought, we think, to have been at least mentioned. In this section we have a very excellent discussion of the infective granulomata. When we turn to that part of the book which deals with special pathology, we note that the reader has at his disposal the fruits of great experience, tempered by a ripe judgment. Comparatively few changes have been made, but the whole has been carefully revised, this being especially the case with the section on nervous diseases, which is one of the best in the book. All the chapters here are good. Especially useful, besides the one already mentioned, will be that on diseases of bone. Those on diseases of the skin and special organs put into comparatively short space information which otherwise a student would have difficulty in obtaining. Throughout this special pathology, the descriptions of disease conditions are clear and good, and the discussions of such important diseases as nephritis and pneumonia leave little to be desired. All through the book there is in this edition a marked improvement in the matter of illustrations, many of the old microphotographs having been cut out and fresh blocks substituted. Looking at the book as a whole, we must recognise in it the high standard of excellence which the success of former editions would lead us to expect. It is most strong when dealing with pathological anatomy, but, taking it all round, we must look on it as the best book available for giving a broad, general view of pathological science.

JAMES RITCHIE.

La pratique des Accouchements. Obstétrique journalière. Par HENRI VARNIER, Professeur agrégé a la Faculté de Paris, etc. etc. Paris: C. Steinheil. 1900.

THE author states in his preface that this work represents the lectures he has been in the habit of delivering for some years past, and its publication was undertaken in response to repeated requests from his pupils. Anything less resembling the British notion of a text-book could not well be imagined. The ordinary obstetric text-book is characterised by the careful exclusion of interesting matter, the conscientious arrangement of dry facts into their logical sequences, and the perpetuation of many hoary traditions, which are of no more importance to the modern student than are the milestones on the Dover road to the modern traveller. Dr. Varnier's work, on the other hand, possesses the animation which distinguishes clinical from book work; its arrangement is novel and readily grasped, and it displays the author's mind pruned of all effete formulas and leaking explanations. It is lavishly illustrated by methods in which photography plays a leading part, and the author's claim that his illustrations lend to the work "*un cachet presqu' outré de réalisme*" is fully justified. There are 387 figures in a work of 437 pages; many of them, however, appear several times, and an illustration is frequently repeated in order to save the reader the trouble of turning back a couple of pages to find it. One of the most striking features is the amount of work done by Dr. Varnier in the illustration of clinical phenomena by photography; but may we be allowed to express the hope that our French colleagues will not seek to out-Herod their surgical brethren by producing cinematograph illustrations of parturition?

Coming to the text, it is difficult, where all is good, to select points for comment and approbation. The account of the phenomena of labour on pp. 70 to 101 is the most graphic piece of clinical description we ever remember to have read, and it leaves an almost ineffaceable impression upon the mind. The analytical study of labour, to which the next seventy pages are devoted, is like the work of another hand; it is precise, deliberative, judicial, and convincing. In speaking of the mechanism of dilatation, those ancient shibboleths "general intra-uterine pressure" and "direct intra-uterine pressure" are abandoned, and the following easy explanation is adopted:—(1) The lower uterine segment presents a solution of continuity—the internal os; (2) it has fewer muscular fibres than the body of the uterus; (3) these muscular fibres are themselves more delicate. In this connection, the interesting statement is made that it is often possible to palpate the contraction ring during the stage of dilatation, by introducing the finger between the membranes and the uterine wall, and noting both a contraction and a relaxation.

In writing of prognosis, the question of the influence of age upon the duration of labour is fully discussed, and from observations of his own upon a very large number of cases, the author reaches the conclusion expressed by Madame la Chapelle, that the labour of an elderly primipara is not longer upon the average than that of a primipara of medium age (20 to 25 years). Respecting posterior positions of the occiput in vertex presentations, from a series of over a thousand cases, it is shown that while the duration of labour is distinctly prolonged, the prolongation is practically confined to the stage of dilatation, and is therefore probably due to the deficient flexion which usually accompanies posterior positions, rather than to the long internal rotation.

The anatomy of the ovum is dealt with in the third section, along with the clinical and mechanical features of the third stage of labour (*Délivrance*), a departure which has much to justify it in the unbroken continuity of description which it allows. This section is beautifully illustrated, but recent work on the early stages of human development receives inadequate notice, the most notable omission being that no reference whatever is made to the important work of Leopold (*Uterus und Kind*). The author expresses himself as unable to decide between the claims of the two rival theories (maternal and fœtal) of the histogenesis of the plasmodial layer of the chorionic epithelium. With regard to the mechanism of separation of the placenta, the author's view is that separation is effected by the contractions which occur during the third stage of labour, and some interesting anatomical facts are adduced in support of it. But it is a curious obsession to deny the existence of the ampullary layer of the decidua, which he states is produced mechanically by the process of separation, for it is a matter of everyday observation that the formation of this layer can be traced in quite early stages of development. A clinical point not generally recognised is well illustrated by photographs, namely, that an ascent of the fundus of the uterus in the abdominal cavity occurs after separation of the placenta, and while it is lying in the lower segment and cervix ready for expulsion; this being, of course, due to the distension of the lower segment preventing the uterus from sinking so low into the pelvic brim. Early expression of the placenta, except when indicated by hæmorrhage or some other complication, is strongly condemned, and statistics are presented which show that an unfavourable course of the puerperium (hæmorrhage, retention of membranes, decomposition of the lochia, etc.), is very much more common when the placenta has been expressed within the first quarter of an hour after the birth of the child than when more time has been allowed. The author specially favours traction on the cord, performed with due care, when assistance of any kind is required.

The section dealing with the puerperium occupies one-third of the volume. The sectional anatomy of the puerperal uterus is fully dealt with and illustrated, and full credit is given to the observations of Helme upon the regressive changes in uterine muscle and connective tissue during the puerperium. The changes occurring at the placental site are well described, and the processes of thrombosis and gradual absorption are illustrated by numerous photographs. The author states that the endometrium is not completely renewed until the end of the sixth week, and even then thrombi may still be detected at the placental site. The whole subject of antiseptics is dealt with in this section. The point of view of the author is indicated in the following sentences:—"*L'accouchée est une blessée. Il la faut donc protéger dans les cas les plus simples comme dans les plus compliqués, contre l'infection qui la guette.*" An apyrexial puerperium, he states, is a product of art, not of nature. An interesting historical sketch of the growth of modern antiseptic practice, illustrated with photographs of the heroes of antiseptics, leads up to a very complete account of the bacteriology of puerperal septic diseases, so far as it has been worked out up to the present time; and the work closes with a sketch of the antiseptic routine practised by the author, which, it need hardly be said, leaves nothing to be desired from the point of view of scientific thoroughness.

We wish for Dr. Varnier's book the cordial reception in our country which it unquestionably merits. T. W. Eden.

Twentieth Century Practice of Medicine. Vol. xviii. London
Sampson Low, Marston, & Co. 1899.

The volume before us is entirely devoted to syphilis and leprosy. The former subject is exhaustively treated by Lang of Vienna, and Jonathan Hutchinson. Leprosy has been assigned by the editor to Prince A. Morrow of New York, and a better choice could not have been made. Already a recognised authority on venereal and skin diseases, Morrow brought a trained mind to the study of leprosy in the Hawaiian Islands and other leper centres; and the impress of his previous studies is very evident throughout this treatise, especially in the chapters on the symptomatology, course, pathogeny, and general pathology of the disease. The rest of the work only falls below the high standard which the author has himself set in the chapters referred to. The sections on the history of the disease, on the methods of dealing with it in ancient and modern times, and on its geographical distribution, are somewhat disconnected. The material is abundant and good, but seems to have been somewhat hurriedly put together. The author, it must be added, exhibits a Frenchman's contempt for the correct spelling of proper names. We meet, for example, with Etius for Aëtius, Abrahams for Abraham, Metchnikoff for Metschnikoff. Danielssen is consistently spelt throughout, even in the bibliography, as Daniellsen. Less eminent men have a choice of surnames, and we observe that Hawtrey Benson figures in one place familiarly as Hawtrey. These defects, the result, no doubt, of haste, do not, however, detract from the real merits of a work which will remain a solid contribution to the literature of leprosy.

We turn with special interest to the chapter on the etiology of a malady which the author characterises as "the most ancient, most exclusively human, and, in the popular conception, the most dreadful of all diseases," for this, after all, is the subject of the deepest importance in connection with an incurable malady. On no other subject in the domain of medicine has professional opinion undergone more extreme fluctuations than on the mode in which leprosy is propagated. The contagious character of leprosy, as Simpson remarked, in that altogether unique series of papers on "Leprosy and Leper Hospitals," published some sixty years ago in the *Edinburgh Medical Journal*, was universally admitted by the profession, until Fernelius and Forestus, in the seventeenth century, began to raise doubts on the point. So completely had the pendulum swung over to the other side, that the Royal College of Physicians, in their Report published in 1867, stated, and quite truly, that "*the all but unanimous conviction of the most experienced observers in different parts of the world, is quite opposed to the belief that leprosy is contagious or communicable by proximity to, or contact with, the disease.*" Morrow represents the almost equally unanimous opinion of the profession at the present day, in considering the contagiousness of leprosy as a corollary to its parasitic nature. Hirsch, writing shortly after the discovery of Hansen's bacillus, says: "*There is only one kind of conveyance of leprosy which cannot be questioned, I mean that which takes place by way of inheritance.*" This is to-day the one kind of conveyance that is most generally questioned. Morrow, indeed, goes so far as to suggest that "the existence of leprosy in the parents exercises upon the offspring a protective rather than a predisposing influence to the disease." There can be no doubt that the main cause of this latest revolution in medical opinion has been the discovery of the *Bacillus lepræ*, although the recent experience of the disease in the Hawaiian Islands, New Caledonia, and elsewhere, has materially contributed to the result. The divergencies and fluctuations of medical opinion respecting the etiology of leprosy are largely to be accounted for by three of its epidemic characters, which have been scarcely sufficiently recognised, namely, its varying virulence, its prolonged incubatory period, and the small proportion of subjects which, under ordinary circumstances, are susceptible to the infection.

In the Middle Ages, when leprosy presented the spreading character which it now exhibits in New Caledonia, its communicability was never questioned. Few, perhaps, shared the exaggerated idea of its infectiousness entertained by Aretæus, who considered it to be no less infectious than plague; but the regulations made for its suppression testify to the universal belief in its communicability. When, at a later period, the disease lost much of its virulence and lingered on as an endemic malady, contracting instead of widening its limits, its communicability could no longer be traced, and began to be doubted. It has once more, during the past half-century, exhibited the features described by early writers on the disease, and its communicability is once more recognised. Leprosy differs from all other infectious diseases in its extremely protracted period of latency. Morrow contends that the duration of this period has been exaggerated, but some of the instances which he adduces as proofs of contagion imply incubation periods of from ten to twenty years, or more. Abraham[1] says that he has himself observed a case in which the pathognomonic signs were not observed until forty years after the person had left the leprous country or could possibly have been in contact with lepers. A few apparently perfectly well authenticated cases of an equally long incubation period are on record. While these are undoubtedly extreme instances, the incubation period of leprosy is generally to be reckoned by years, and not by months. This obviously renders it hopeless in most cases to trace the disease to a definite source, or to ascertain the time and circumstances of infection. The third peculiarity, operating in the same direction, is the circumstance that the vast majority of those who live in the closest and most prolonged association with lepers escape the infection. These three features of the disease go far to explain the widely different opinions that have prevailed at different times, and which to some extent still prevail, respecting the mode in which leprosy is propagated. The author points out very clearly the insuperable objections to "the fish theory" of Hutchinson, and many of these apply equally to the view advanced by Creighton, that leprosy is the result of a "semiputrid or toxic character of animal food, just as the allied pellagra is caused by a semi putrid or toxic character of the bread or porridge." The altogether conclusive argument against these theories is the prevalence of leprosy in castes who eschew fish and flesh in any form, and its occurrence in individuals who never tasted animal food. The Jains, for example, in India carry their religious scruples against partaking of anything that has life so far, that they cover the mouth with a piece of cloth to avoid inhaling insects, and strain their water through cloth lest any animalculæ should be accidentally swallowed. Yet the Jains and other almost equally strict vegetarians are not exempt from the disease. From the inquiries of the Leprosy Commission in India,[1] into the food habits of a number of leprous patients from the Hill Districts, it was ascertained that 23 per cent. of them had never tasted fish, 58 per cent. had used it occasionally, and only 19 per cent. consumed it habitually. No evidence, in fact, can be more conclusive than that which has been adduced, to prove that communities and individuals who neither partake of fish nor flesh are liable to leprosy. Whether the use of semiputrid fish or flesh does, or does not, predispose to or aggravate leprosy, is another question, and one on which we hesitate to pronounce an opinion.

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[1] Allbutt's "System of Medicine," vol. ii.

The doctrine that the virus of leprosy exists in the surroundings of man, without connecting it with any special defect of diet, is supported chiefly by negative considerations, such as the difficulty of tracing its appearance in particular localities to importation, or demonstrating its origin in individual cases to infection. To our mind, the one argument of some weight in favour of this hypothesis, but which its supporters never make use of, is the occasional occurrence of sporadic cases in countries where the disease has long since ceased to be endemic. On the 6th of June 1855, Dr. Broadbent exhibited, at the request of Mr. Syme, a young man from the Hebrides who had been suffering from tubercular leprosy for ten years. Haeser states that he saw two cases, in his student days, of developed leprosy, in an old beggar and his daughter who lived in the vicinity of Jena. References to a few additional cases of the same kind will be found in Hirsch's well-known work, respecting which he remarks, that "we are here at the limits of our knowledge, and there is not a single well-grounded hypothesis to show the way beyond." A case occurred in an Irishwoman named Johanna Crawley, who had never been out of the British Islands, and who had lived for thirty years at Stepney. Stepney is a locality in which the possibility of direct or indirect communication with lepers cannot be excluded, and this certainly raises a doubt whether these sporadic cases may not really be instances of obscure infection.

The case as regards heredity is not quite so clear as some suppose, and Morrow has scarcely, we think, stated it fairly. We shall include under this term all sorts of real or supposed conveyance by inheritance—the direct transmission of the virus from parent to offspring, intra-uterine infection, and an inherited predisposition to the disease arising from the fact of leprous ancestry. It need scarcely be said that heredity can have nothing to do with the appearance or spread of leprosy in populations formerly exempt, nor with the occurrence of the disease in Europeans free from hereditary taint during their residence in a leper centre. If heredity plays any part in the etiology of leprosy, it must be in perpetuating the malady in places where it is endemic. Morrow, while he formally admits that the question is still *sub judice*, shows in no doubtful way that the judgment is already a foregone conclusion, or rather he inclines, as we have said, to the belief that the fact of a leprous ancestry increases the resistance to the infection. What then, we ask, were the grounds which led all observers only a few years ago to look upon the hereditary conveyance of leprosy as beyond all question? It was urged, to use the words of Hirsch, that "leprosy clings to particular families, as a consequence of continuous inheritance, from generation to generation, and that the extension and multiplication of these small centres of disease are due to intermarriages among the members of leprous families and families which had been hitherto healthy." The heredity of leprosy, he goes on to say, was ascertained in Bergen by Boeck and Danielssen for 185 out of 213 cases, by Brunelli in Crete for 76 out of 122, by Profeta in Sicily for some three-fourths of a total of 114, by Fiddes in Jamaica for 184 of 213, by Hillis in British Guiana for thirty-one out of 188," and so on. By the phrase, *the heredity of leprosy was ascertained*, nothing more can be signified than that the lepers in the proportions stated were found to belong to leprous families. The answer to this argument, as given by Morrow, is, that "the opportunities of post-natal infection in the thousand-and-one intimacies of family life are more reconcilable with the chances of accidental contamination than the theory of heredity." Those who admit the possibility of contagion cannot deny that it is in the family it should be expected to show itself. But infection does not exclude heredity. Nor are the reasons advanced by our author for rejecting heredity by any means conclusive. He quotes Impey's statistics, showing that at Robben Island, in Cape Colony, the history of leprosy in the parents of lepers could only be made out in about 9 per cent. of the cases. But nothing, as we know from experience, is more difficult than to extract the truth from a leper respecting his family history. A leper, as a rule, would sooner confess that his forefathers had committed all the sins in the Decalogue than admit a leprous taint. One's faith in the value of statistics suffers a shock when we contrast the Robben Island figures with those quoted above referring to the pre-bacillus period. Whatever may be the facts as regards Robben Island, it would have been well if Morrow had pointed out that other observers had obtained widely different results. Morrow quotes, again, Robben Island figures, to the effect that no more than 3 per cent. of the children born of leper parents become lepers. It is this small proportion which leads him to conclude that the existence of leprosy in the parents exercises upon the offspring a protective rather than a predisposing influence; for "we can scarcely conceive," he says, "that of an equal number of children born of healthy parents placed in this leprous environment, and subjected to the numerous chances of contamination incident to the intimate contact of family life, only 3 per cent. would escape." We should like to know if as many as 3 per cent. of the nurses and attendants in constant contact with the patients in the Robben Island Asylum have contracted leprosy. It would also be important to know the ages of the children, for leprosy is rare in children under 10 years of age. If the children were under puberty, 3 per cent. of lepers would be a large proportion. Carter remarks very truly upon this point, that "what one sees in a leper family is not always valid evidence, for until the whole future of the offspring of affected parents is known, one cannot be sure that the descendants are really free." The Robben Island statistics, as our author presents them, certainly lend no support to the view of hereditary immunity. Here, again, the discordant results of observations made before and after the discovery of the *B. lepræ* simply stupefy one who desires to obtain a solid basis of fact on which to form a judgment. Lewis and Cunningham found that of sixty-eight children born of leprous parents in the Kumaon Leper Hospital, twenty-seven, or nearly 40 per cent., were already subjects of leprosy when the report was written.

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[1] "Report of the Leprosy Commission in India," Calcutta, 1893.

There is only one way of settling this vexed question, and that is by ascertaining whether the children of lepers, removed at birth from association with their parents, contract the disease in after life in greater proportions than children of healthy parents living in the same locality, and under similar conditions. Morrow on this part of the evidence gives the statistics of the Almora Asylum in India, according to which, out of fourteen children of lepers so separated, one had died, but none at the time referred to had shown signs of leprosy. From a later report of the same institution, however, we gather that one out of fifteen, or 6·6 per cent., developed leprosy, but here again the future of these children is uncertain—many of them may afterwards have become affected. Abraham says that in the Trinidad Asylum Orphanage one in eight of the inmates became affected. This writer also mentions two cases, reported by Bibb from Mexico, in which the children were removed at birth from their leprous mother, and brought up in districts free from leprosy, amid healthy surroundings, and never came in contact with lepers, but who nevertheless developed the disease. It must be admitted that the statistics available on this point are neither so full nor reliable as to justify a final conclusion, but, so far as they go, they seem to favour the old opinion that the children of lepers are specially liable to the disease.

On the question of communicability, Morrow utters no uncertain sound. Leprosy, according to him, is inoculable and also communicable by the breathing air, and possibly in other ways. He states pretty fully, however, the grounds on which contagion has been denied. These are—(*a*) The alleged immunity of physicians, nurses, and attendants, in leper hospitals, and the rarity of its spread from leper houses to the community outside. "There has never been a case" Hirsch says, "in which physicians or nurses in leper houses have caught the disease, although they mix with the patients without restraint, dress their sores, and sometimes wound themselves in doing so." Although this sweeping statement can no longer be literally accepted, it is well to bear in mind that, with the exception of a very few doubtful cases, it holds good for leprosy, as seen in most parts of the world. Nothing, indeed, is rarer than for attendants on lepers to contract the disease in countries where leprosy is simply endemic. Thompson[1] quotes Zambaco's account of the monks of Mount Athos, who have for fifty years devoted themselves to the care of lepers. Many of them, we are told, thinking it would be a special sign of grace if they were stricken with leprosy, associated with them in their lodgings, shared their food, and even wore their flannels and underclothing saturated with the discharges of leper's sores, but not a monk has ever contracted the disease. (*b*) The failure of all attempts (about fifty in number) to inoculate the disease in healthy subjects, is urged as a proof that it is not inoculable. Morrow points out that this line of evidence cannot be accepted as conclusive, and remarks that "it is well known that the germs of diphtheria, scarlatina, cholera, and typhoid fever, etc., have never been inoculated in man, but this negative evidence cannot be considered as proof of their non-infectious character." We were under the impression that scarlatina had been repeatedly communicated by inoculation, and that the medical profession had obtained only too conclusive evidence of the inoculability of diphtheria. Be this as it may, the failure to inoculate a disease, although it is no proof that such disease is non-infectious, does raise some doubts as to whether inoculation is the ordinary mode in which it is propagated. (*c*) The failure of leprosy to spread in certain countries, such as the North-Western States of America, into which it has been freely introduced by Scandinavian immigrants, is another argument made use of. Thompson has lately pointed out that, although more lepers were introduced into Victoria than into Queensland or New South Wales, leprosy failed to spread in the first mentioned colony, and that in Australia no instance is known of the disease having originated in a white colonist south of the 35th parallel. These facts, however, only show that infection or contagion operates under given conditions not everywhere present. (*d*) Another point of some weight urged by Thompson, on the strength of his Australian observations, against the doctrine of contagion, is that a number of the cases occurred in white people, who had never to their knowledge come in contact with lepers. It may be added that not a few Europeans who have contracted the disease in India tell the same tale. The Indian Commissioners remark that the native leper, "in an overwhelming majority of instances, denies that he has ever had any contact or intercourse with lepers." Whatever weight may be attached to evidence of this kind, it tells rather against contagion than infection, but it must be admitted to be a very remarkable feature of leprosy, viewed either as a contagious or infectious disease, that one will escape it after the most prolonged and intimate association with lepers, while another contracts it without having come, so far as he knows, into the most distant relation with a leper. (*e*) To these considerations this may be added, that while the discovery of the leprosy bacillus has undoubtedly strengthened the case for the communicability of the disease, it has also furnished some new grounds against the doctrine of direct contagion. No infective organism is more abundantly or more continuously given off from the diseased body, than the bacillus of leprosy. According to Morrow, it is met with in the saliva in the nasal mucus, in the conjunctival secretions, in vaginal, urethral, and uterine discharges, in the semen, milk, and fæces, in the secretions of leper sores, and it is also freely given off from the free surface of the skin, and by the breath. Schäffer estimates that a leper reading aloud discharges into the atmosphere from 40,000 to 185,000 bacilli in ten minutes. If these bacilli were infective in the state in which they are discharged, and if susceptibility to the disease were at all common, no one living near a leper could escape. The organism must be inhaled by those attending lepers in the breathing-air; by settling on food, it will be ingested, and by coming in contact with sores or abrasions, the chances of accidental inoculation must be frequent.

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[1] "History of Leprosy in Australia," *Syd. Soc. Translation*, London, 1897.

We have dealt thus fully with the considerations which seem to tell against the doctrine of the communicability of leprosy, because they lie at the root of a correct understanding of the etiology of the disease. To ignore them, is to leave out of view some of the most interesting and characteristic features of the disease. These facts are not to be ignored any more than those which point to its communicability, if we are to understand the problems which the epidemiology of leprosy presents. The main point to be decided in the meantime, on account of its bearing on prophylaxis, is whether the leper himself is the primary source of the infection, or whether, on the other hand, the virus exists in certain regions and localities independently of the leper. We agree with Morrow, that the leper is the essential factor in the creation of an endemic centre, and the sole means of propagating the disease from infected to healthy regions. Leprosy has never appeared in a country previously exempt, until opportunities have occurred for its introduction from without. No doubt, general and local conditions will determine whether it will die out, or take root and spread. Nothing whatever is known as to the conditions which intensify the virulence of the infection in one country and attenuate it in another, but the fact of the varying virulence of leprosy is testified to by history, and confirmed by modern experience. Morrow tells us that from 9 to 10 per cent. of the attendants on the leper settlement of Molokai become contaminated. If the monks of Mount Athos were transferred to Molokai, they would not be disappointed in obtaining the special sign of grace that they have been seeking for in vain at home. A proof that the leper himself is the source—direct or indirect—of the infection, has lately been furnished by Auché, from New Caledonia, which was not available when Morrow wrote. He tells us that the first case of leprosy among the white population of that island was observed in 1888. In 1898, no fewer than 132 Europeans had become affected, but no case of the disease had occurred among those criminals, 4095 in number, who were interned on the Ile de Pins, and other places, where they were absolutely cut off from all communication with lepers.

If these views are correct, it is evident that the measures proper for dealing with the disease in Europe would not be adapted to countries where it spreads in a quasi-epidemic form, so as to be a source of danger to the whole community. The views respecting prophylaxis advocated by Morrow appear remarkably judicious. We have only to add, that the chapter on treatment is full and practical. Leprosy remains an incurable disease, but our art can do much for the alleviation of the sufferer. The means of relieving the numerous distressing conditions incident to this affection are discussed with judgment in this volume.

ANDREW DAVIDSON.

The Treatment of Diseases of the Nervous System. By JOSEPH COLLINS, M.D. New York: Wm. Wood & Co. 1900.

To those whose treatment of nervous diseases consists in the routine administration of iodide and bromide of potassium, with an occasional diversion into the so-called "rest cure," a book of six hundred pages mainly devoted to this subject may at first sight appear surprising. But a rapid survey of this work will show them that the object which the author has in view, in thus detailing and elaborating therapeutic resources, has as its basis the placing of less reliance upon drugs, and more upon general hygienic and physical measures. And those students of clinical neurology who are already acquainted with the writings and investigations of Dr. Joseph Collins, will find in this treatise the same grasp of general principles and breadth of view which is a distinguishing feature of his work. In his preface the author refers to the well-known stubborn nature of chronic nervous affections, and to the difficulty which he has found in obtaining information on current neuro-therapeutics—hydriatics, massage, rest and exercise, electricity and psychotherapy—except by reference to special treatises. The main object of his book, therefore, is to place within two boards and the reach of the practitioner the varied and numerous methods which have come to be adopted in the management of nervous affections, the diseases in which they are suitable, and their means of administration and regulation.

There is a general introduction to the subject in a chapter upon the causes and origination of disease of the nervous system, in which heredity, injury, sex, syphilis, and general infective processes are shown to play their part. This paves the way to a chapter upon the prevention of diseases of the nervous system, more especially syphilis, upon the treatment and prognosis of which the author has strong views, though wholly in accordance with modern neurological belief. Five pages upon the education and bringing-up of the neuropathic child are the best which the reviewer has yet read upon the subject, and are well worthy the careful attention of many parents, and the pedagogue, who is so frequently absolutely ignorant of the emotions and temperament of the young over whom he has charge.

Part 2 of the work is devoted to a general consideration of the actions and uses of drugs in the treatment of nervous diseases, of hydrotherapy, of electrotherapy, of massage, of exercise, rest, and occupation, of diet, and of psychotherapy. It is quite impossible in a short review to do more than merely mention the headings of the chapters, but they are pregnant with information upon general principles and details, of methods and of variations, the whole being tempered with sound personal observations, the results of a ripe experience. Some recent therapeutic methods receive a fitting *congé;* for example, this is what is said of testicular therapy: "Not a scintilla of acceptable evidence has been offered to warrant the continuance of its use, and it is mentioned here merely to be warned against."

That the author has carefully considered the position in therapeutical teaching of the many forms of treatment and exercise generally recommended, may be seen from the remarks which are herein quoted. Of electrotherapy he says: "If the physician will master the simple principles of electricity, and give heed to the physiological and physical effects which follow the application of the electric current to the different tissues of the body, he can erect for himself a rational basis for its use." Of massage he says: "Even now its use is largely in the hands of persons whose mental endowment and training allow them to make claims for its usefulness which to even a tyro in physiology and pathology are absurd, and whose conception of pathological processes is so sterile that they publish cures which surpass human understanding"; but, on the other hand, when properly carried out, it has "come to stand upon a solid foundation of experimentation, so that to-day its use as a curative agency is as legitimate as anything can possibly be."

Of hypnotism he says: "It is a state of exalted suggestibility, capable of artificial production in almost all persons, in which the subject affected is more than ordinarily susceptible to the control and stimulation of the one who has thrown him into the hypnotic state. There is no more mysteriousness about it than there is about other modes of beneficent influence that every physician uses in daily practice."

Part 3 is given over to the treatment of the diseases of the cerebral membranes and of the brain and spinal cord. Each disease is introduced by a succinct description of its etiology and symptomatology. It is hardly necessary to say that this is of the clearest and most useful nature; so that, in addition to being a treatise on treatment, the book before us is really a valuable addition to our text-books on nervous diseases, but one in which treatment has no subsidiary position.

It is not proposed to refer in any detailed manner to this portion of the book, which will naturally be studied with much care and attention by those practitioners into whose hands there fall the inveterate cases of chronic nervous disease. We would especially call attention to the remarks upon the operative treatment of cerebral tumours, Fränkel's method of dealing with locomotor ataxy, the treatment of sciatica and of neurasthenia, and finally the methods of dealing with headache and insomnia.

We warmly recommend the volume to the attention of physicians, and strongly support the method which the author has adopted, in giving a greater amount of space to the discussion of headache, neurasthenia, and the other so-called functional disorders than to the organic diseases; the neurasthenic is a far greater sufferer than the victim of disseminated sclerosis.

W. ALDREN TURNER.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

LIFE ASSURANCE.

THE Medical Director of the New York Life Assurance Company, Dr. Poel (*Albany Med. Ann.*, March 1900) briefly defines the position medical examiners of those proposing for assurance should assume. Since life assurance was established in Great Britain and America, from 10 to 15 per cent. of all applicants have been obliged, until recently, to be rejected for impairment of their personal condition or for their family histories. No scientific formulæ were extant to guide insurance companies and their examiners in their decisions. Recently, however, the American companies, recognising that among the large number rejected there were many to whom the benefits of life insurance might well be extended, have classified many thousand examples of damaged lives, as to the significance of the impairments accompanying them. At first, consumptive cases alone were proposed to be investigated among the tubercular, and in terms of their family records, but it was found impossible to separate the hereditary taint of consumption from other sources of impairment, so that in the following figures the mortality is influenced partly by other circumstances.

In connection with consumption, of 10,000 cases, 3000 of them being rejected lives, which had applied during the course of fifteen years, and had been, if kept up, carried on for more than ten years and up to a limit of twenty-five years, 9500 were traced, and accurate information obtained about them. Poel does not offer any actual statement of the results afforded, but claims that the more accurate knowledge gained from them permits his company to graduate the risks of under-average lives much more scientifically than hitherto, and very largely independently of the local examiners. The latter are asked rather to describe than to judge; their descriptions allowing the head medical staff to appraise the cases at their probable value. The examiner is required to give a pen-picture of the proposer, as personally met with, which, when complete, should be sufficient to give the head officials a satisfactory idea of the circumstances of the case; if not satisfactory, he has to amplify it. Extra schedules have to be filled up, as, for instance, when any symptom of cardiac derangement is noticeable, charts for the location of the apex-beat area over which any murmur present is heard, and the direction of its transmission, etc., are supplied. If the urine contain albumin, a sample is sent straight to the head office by mail. Urotropin, 4 grs. to each sample of urine, has been found to preserve it unaltered, and not to interfere with any of the necessary tests.

In a book by Arthur Hesse ("7066 Todesfälls der Basler Lebensversicherungsgesellschaft," Leipzig, 1899), the data relating to 7066 persons insured in the Basle Life Insurance Company, from 1865 to the end of 1887, are collected. Phthisis caused 20·08 per cent. of the deaths; other tubercular diseases 3·15 per cent, or 23·23 per cent. in all. These cases showed also the shortest duration of life after assurance. The proportion of all those dying within ten years of insurance from tubercular diseases to the total number of deaths during that period, was 32·32 per cent.; in the second decade, 24·91 per cent.; and in the third, 18·08 per cent.

Heredity is shown to be of importance in many cases. Among 640 claims made for insurers who died from cancer, death from that cause bulked more largely in the family necrologies than in those dying from other causes. In the instances where, at the time of assurance, one of the near relations of the proposer was recorded as having died of cancer, the proportion of deaths from that disease reached 20·74 per cent. compared with a general percentage of 9·08. The same is shown in the case of tubercle. A new and interesting point is raised in the statement, that among those in whose families deaths from enteric fever have occurred, there is, generally speaking, a lessened power of resistance to the disease apparent from the mortality returns. As to the personal history of the proposers, 19·27 per cent. of those who died from rheumatism or gout suffered from attacks of these ailments before examination.

As great a proportion as 49·90 per cent. of the 1092 individuals, described on entry as of thin habit of body, died from tubercular and other pulmonary diseases; while, of the 1716 stout persons, the majority succumbed to diabetes, apoplexy, or kidney disease. Hesse also notes that of those noted as of pale complexion, tubercle and cancer predominated; in those of ruddy hue, alcoholism, apoplexy, and heart disease were most common.

The comparative frequency of deaths from various diseases among the 7066 cases discussed, in descending order, was as follows:—Tubercle, cancer, circulatory diseases, apoplexy, pneumonia, digestive diseases, especially liver complaints; nervous, bronchitic, infectious, renal, senile, accidental, and suicidal causes; obesity, alcohol, rheumatism, gout, pleurisy, and diabetes.

Croner (Inaug. Diss., Berlin, 1899, referred to *Schmidt's Jahrb.*, Leipzig, Bd. cclxv. No. 3) deals with the subject of phthisis pulmonalis as influencing life assurance. His data were obtained from the records of the Victoria and the Prussian Life Assurance Companies of Berlin, comprising 612 cases, of which he was able to give precise information as to the different factors investigated; their occupation, personal condition, heredity, etc. Masons, postmen, tailors, saddlers, and weavers contributed the largest number of deaths from phthisis; then smiths, metal-workers, bakers, butchers, and servants. Doctors and teachers were in very small proportion. In two-thirds of the cases no family history of tubercle was given, while Croner suggests that the extent of actual contact between the relatives who have died of tubercular diseases and the proposer, and his previous environment, are of more importance than the mere fact of such deaths.

At the first International Congress for Medical Officers of Insurance Companies, held at Brussels last September, a number of interesting points were raised. Verhoogen laid stress on the early and frequent, although slight, symptoms of commencing general paralysis, paresis from the upper twigs of the facial nerve, especially if combined with increased knee-jerk. The debatable subject of albuminuria was of course considered, and gave rise, also of course, to differences of opinion.

Vas (*Orvosi hetil.*, Budapest, 1899, No. 41) recommended the acceptances of proposers, with addition of an extra premium, where albuminuria had occurred in an otherwise healthy person, less than 45 years of age, and which, after several examinations, showed no increase in amount of albumin, nor any tube-casts or renal epithelium. Wybauw at the Congress advised absolute rejection. In cases of cyclical albuminuria the general opinion seemed to be that those suffering from it were insurable at increased rate, if under 30 years of age, as long as there was an understanding that if five years later the albuminuria still persisted, the policy might be rescinded.

As regards glycosuria, Vas holds that evidence of even the most transitory form calls for rejection of the applicant. Le Bœuf and Siredey would allow acceptance if the presence of the sugar in the urine has only lasted for a short time, has not reappeared for at least five years, if there is no hereditary or personal taint, and the urine be otherwise normal. The great danger accompanying such cases, should the glycosuria persist more or less constantly, is the lessened power of resistance to other diseases possessed by these individuals. Houzé goes so far as to recommend the medical examiners to measure anthropologically the proposers, so that after death their identity may be established beyond doubt.

Moritz brought forward a large number of cases in which heart disease had caused death, to show the impossibility of following out Sir William Gairdner's grouping of circulatory risks, in his communication made to the British Medical Association at the last meeting of that body in Edinburgh; stating that there may be no subjective or objective signs of cardiac disease in cases where sudden death from this cause may closely succeed. Also he notes that the "insurance heart," the influence of emotion and nervousness upon the action, strength, and regularity of the heart, must interfere with any rigid classification of cases in which one or other slight abnormality can be detected.

Bayet (*Klin. therap. Wchnschr.*, Wien, 1899, No. 43) would reject all those who exhibit symptoms of active secondary or tertiary syphilis, unless three years have passed since infection; those who are also alcoholic; and those who show the slightest symptom of any nervous complication.

SURGERY.

UNDER THE CHARGE OF

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HYPERTROPHY AND EPITHELIAL TUMOURS OF THE PROSTATE.

MM. ALBARRAN and HALLÉ, in revising the pathological anatomy of the hypertrophied prostate, have made important additions to our knowledge of this subject. They have subjected to a minute microscopical examination a consecutive series of 100 prostates of patients who have died in the Neckar Hospital, and who presented during life the symptoms and signs of prostatic hypertrophy. Three types of enlargements were observed—

1. *Pure glandular or adenomatous hypertrophies* (thirty-two cases).—To the unaided eye the section of the prostate presents a definitely areolar or lobulated appearance; microscopically, the glands are increased in size and number, and their arrangement somewhat disordered; the epithelium lining the acini may be normal or increased in thickness; the lumen of the acini is either empty, or partially filled with granular débris and concentrically laminated concretions. The stroma between the acini is relatively small in amount, and is normal in structure.

2. *Pure fibrous hypertrophy* (three cases).—The lobulation is again well marked; the individual lobules are dense, solid, and homogeneous, and are composed of adult fibrous tissue, with very few muscular fibres disposed concentrically around the degenerated remains of the acini; the blood vessels are few in number, with thickened walls; their lumen is either narrowed or obliterated.

3. *Mixed glandular and fibrous hypertrophy* (fifty-one cases).—The lobules differ from each other in structure and consistence; the majority show an increase in the amount of glandular tissue, the minority are in process of fibrous transformation.

It will be seen that the above analysis confirms that of Motz, and that the hyperplasia of the glandular tissue is the preponderating factor in prostatic hypertrophy. Albarran and Hallé believe that the glandular element is the essential factor in all forms of prostatic hypertrophy, and that the changes in the stroma are secondary.

EPITHELIAL TUMOURS OF THE PROSTATE.

AMONG the 100 hypertrophied prostates already referred to, there were fourteen which, although indistinguishable with the unaided eye from the common innocent senile enlargement, presented, on microscopical examination, manifest epitheliomatous new formations. Of these there were two types.

1. *Adenoid epithelioma*, which is the more common of the two, is met with in the form of circumscribed nodules in the substance of the

hypertrophied prostate; the nodules are composed of epithelial tubes closely packed together with a small amount of intervening stroma; the tubes are arranged quite irregularly, and either lined or filled with epithelial cells. The tubular structure of these epitheliomatous nodules forms a marked contrast to the acinous arrangement of the glands in the normal prostate, or in that which is the seat of innocent hypertrophy, and resembles certain adenoid epitheliomata of the kidney. Although the nodules are circumscribed, their encapsulation is often incomplete; their number and size vary in different cases; there may be only one or two, or they may be disseminated throughout the organ; the smaller ones are about the size of the head of a pin, but they may attain the size of a pea or a hazel-nut, and are then readily recognised by the naked eye. The condition of the remaining tissue of the prostate is like that met with in the ordinary senile hypertrophy. Albarran and Hallé regard these epitheliomatous nodules as an accidental complication of innocent hypertrophy, and as being evolved from the benign overgrowth of the glandular tissue of the prostate; all intermediate or transition forms may be observed between the innocent and malignant types of hyperplasia. According to the authors, this lesion has not been recognised by previous observers; its histological characters are illustrated by a series of excellent figures.

2. *Alveolar carcinoma* is the name given to the rarer variety of malignant transformation of the hypertrophied prostate; the epithelial cells transgress their normal limits, and infiltrate the stroma of the organ, and occasionally infect the adjacent lymphatic vessels; it may occur in association with adenoid epithelioma, so that both malignant types may be present in a prostate which to the naked eye appears to present the ordinary features of senile hypertrophy. The carcinomatous element may therefore easily escape recognition, unless the organ is subjected to a very complete microscopical examination.

The authors suggest that there is nothing extraordinary in the view that the malignant element may be grafted upon an already existing innocent hyperplasia of the glands of the prostate, for a similar transformation is accepted as occurring in the thyroid, mamma, kidney, and salivary glands. The apparent discrepancy relates rather to the clinical features, since our knowledge of the nature and progress of the common senile enlargement of the prostate does not at first sight bear out this conception of malignant transformation taking place in such a large proportion (14 per cent.). There appears to be the most absolute discord between the well-known clinical features and the results of the histological examination as given above. The authors maintain, however, that while in the majority of cases the senile enlargement of the prostate maintains its innocent character to the end, there are cases which may be observed to follow a different course. Instead of an initial period of nocturnal frequency of micturition or of an easy catheter life, compatible with perfect health, for an indefinite number of years, and only terminating fatally by some accidental septic complication, or by some intercurrent senile disease, there *are* cases in which the clinical progress is more rapid and the duration of life very much shorter. In these the period of simple nocturnal frequency is curtailed, retention becomes a prominent feature, the prostate enlarges steadily and irregularly; one of the lateral lobes may predominate, and may present bosses of unequal consistence; the general health fails in the direction of cachexia; and the patient may die within two or three years from the first onset of symptoms, without any evidence of the usual septic complications, which would be regarded as a satisfactory explanation of the fatal termination. Ths authors believe that the unusual clinical phenomena observed in these cases depend upon a malignant transformation of the hypertrophied prostate, and since they have been on the outlook for such cases they have succeeded in identifying them clinically. For the notes of these we must refer the reader to the original paper.—*Ann. d. mal. d. org. génito-urin.*, Paris, February and March 1900.

THE REDUCTION OF CONGENITAL DISLOCATION OF THE HIP BY MANIPULATION.

PARADIES reported to the Surgical Society of Berlin the results obtained in the Moabit Hospital. The most suitable age is between 2 and 6 years, not only for yielding the most satisfactory correction of the deformity, but also for avoiding the various accidents which may attend forcible reduction, namely, tearing or stretching of the vessels and nerves, fracture of the femur, etc. The head of the femur was actually replaced in the acetabulum in 10 per cent. of the cases between the ages of 18 months and 6 years. Above this age, while the functional results may be satisfactory, the head of the bone is rarely replaced in the acetabulum, but is made to occupy a fixed position below the anterior-superior iliac spine. Paradies inveighs against the use of too great force; if the reduction is not successful on the first attempt, the limb should be put up in plaster of Paris for fourteen days, in the attitude of marked abduction, extension, and eversion. If one again fails to make the head of the bone enter the acetabulum, the limb should be placed in the attitude of medium abduction and inversion, so as to bring the head as nearly as possible opposite the acetabulum. The period of retention in plaster of Paris averages five months. In the after treatment it is important to try and strengthen the abductors and internal rotators of the hip. Although congenital dislocation of the hip is much less common in this country than in Germany, it is much to be desired that practitioners should recognise the lesion, and give the patient the chances of reduction before the age of 6. It is the experience of the abstractor, that cases of congenital dislocation of the hip are either mistaken for hip-joint disease or are allowed to grow up without proper treatment.—*Centralbl. f. Chir.*, Leipzig, March 10, 1900.

ACCIDENTS DURING EPILEPTIC FITS FROM THE CONTRACTION OF MUSCLES.

M. FÉRÉ, physician to the Bicêtre Hospital, draws attention to the above. They include *asphyxia*, from the spasmodic contraction of the muscles of the neck and thorax; *rupture of the heart*, especially if it is already the seat of disease; *rupture of the liver*, and *rupture of the* *diaphragm.* The violent contraction of the masseter muscles is responsible for the well-known *laceration of the tongue*, which may be serious in itself, or may become so, as the result of septic complications; the contraction of the depressors of *the lower jaw* may cause its *dislocation. Fractures of the long bones*, while not uncommon from a violent fall at the onset of the fit, are very rarely the result of muscular contraction; the cases are exceptional in which the bones are so altered that they undergo spontaneous fracture. The author has observed only one patient in whom an *inguinal hernia* developed in consequence of the muscular spasm during an epileptic fit. The lesion which has specially interested the author is the occurrence of *muscular hernia through an aperture in the sheath of the tibialis anticus muscle.* He records the case of a labourer, æt. 45, who had an epileptic fit after every bout of intoxication. On awakening from the stupor following a fit, he complained of having received a blow on his right leg; on examination, there was a circumscribed swelling without any evidence of bruising; it was situated at the junction of the middle and lower thirds of the leg, at a distance of 3 cms. from the crest of the tibia; its long axis was vertical, and about the size of an almond; it was sensitive, and appeared to fluctuate from side to side. When the swelling was reduced by pressing over it, or by extending the leg and pointing the toes, an elliptical opening 3 cms. in length was discovered in the aponeurosis, through which the tip of the finger passed easily; the edges of the opening were sharp and regular. After resting for a few days, he was able to go about as usual, and was transferred to a provincial asylum. Having had his attention directed to this lesion, the author reviewed a series of 204 lunatics, and found it present in thirty-one; in fifteen of these it was present on both sides. Among the latter there were three who presented two swellings on the left leg, and two who presented two swellings on the right leg. The appearances, which are illustrated by photographs, are remarkably symmetrical; the swelling is nearly always situated between 3 and 4 cms. from the crest of the tibia, and in the middle third of the leg; it is easily reduced, and one is then able to feel the opening in the aponeurosis. In the cases with multiple swellings, the aponeurosis appeared to be cribriform. The author is of opinion that the gaps in the aponeurosis constitute the primary lesion, and that the hernial protrusion of the muscle may take place at any time.—*Rev. de chir.*, Paris, January 1900.

Subphrenic Abscess.

Weber reported to the Surgical Society of Berlin that out of a total of 600 cases of appendicitis (350 with abscess formation) in Sonnenburg's Hospital and private practice, the complication of subphrenic abscess was met with in nine. In six of these, the appendix and cæcum were displaced beneath the liver, so that the suppuration passed directly into the subphrenic space, extraperitoneally in one case, intraperitoneally in the majority. Pyothorax was also present in six cases; there was dry pleurisy at the base of the lung, and of the diaphragmatic pleura in two cases. The subphrenic abscess is easily opened and drained when it comes to the front below the costal margin; when it develops posteriorly, it must be approached by the transthoracic route. The rarity of subphrenic abscess in so large a number of cases of appendicitis is ascribed to the treatment of the latter by operation at a relatively early period of the disease.

Karewski reported a case of subphrenic abscess following on osteomyelitis of the eleventh and twelfth ribs, and another case in a girl of 9, who had been run over by a vehicle; four weeks after the accident there was resistance in the left hypochondrium; a portion of the tenth rib was resected, the two layers of pleura were united with sutures, the diaphragm was incised, and the necrosed spleen was removed along with a quantity of pus.

Körte had operated on thirty-five cases of subphrenic abscess, no less than sixteen of which were the result of appendicitis; the others orginated from the stomach, the liver, the kidney, the pleura, and from osteomyelitis of the ribs. In three cases, the origin of the abscess was not ascertained.—*Centralbl. f. Chir.*, Leipzig, March 10, 1900.

Aseptic and Antiseptic Surgery.

It is interesting to find further evidence of the swing of the pendulum from the supposed perfection of asepsis to the more reliable antisepsis in continental cliniques. Bumm of Basel, having tested bacteriologically the entire armamentarium of his clinique, discovered that asepsis was not attainable. Soon after an operation was commenced, bacteria were found on the hands, in the gauze, in the wound, in the ligature material, and in the supposed sterile salt solution. The organisms were chiefly the *Staphylococcus aureus* and *albus*. The hands of the operator and his assistants were always found to be the source of their presence. It was found impossible to render the hands sterile for any length of time by any method at present in use. On reverting to antiseptic methods, the bacteriological results have improved considerably. Bumm recommends that every operating surgeon should either habitually abstain from contaminating his fingers with septic material, or should wear rubber gloves when such contact cannot be otherwise avoided.—*Centralbl. f. Chir.*, Leipzig, March 10, 1900.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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An Unusually Complicated Case.

Paul F. Munde (*Yale Med. Journ.*, N. Haven, November 1899) saw in consultation a well-nourished though anæmic woman, the mother of four children, who complained of pain in the rectum, mainly during defæcation. Menstruation was regular. A small mass behind the uterus was discovered. Three weeks later this had increased in size, and laparatomy revealed a tubal pregnancy and numerous blood clots. The ovisac had escaped from the end of the tube, which was unruptured, thus accounting for the absence of abdominal pain. The tube was ligatured and removed together with the coagula, and the abdomen closed after irrigation.

The wound healed by first intention, but on the eighth day the temperature rose suddenly and the urine contained pus. Vaginal examination revealed in the left anterior vaginal vault what was evidently a renal calculus impacted in the left ureter. There was no sign of distension in the left kidney, and a good amount of urine was being passed. The bladder was irrigated at frequent intervals, and the patient improved, until, six days later, her temperature rose to 104°, with severe pain in the "ilio-renal" region. The extreme adiposity of the patient prevented palpation of the kidney or appendix. An exploratory incision was made, when both the right kidney and appendix were found to be apparently normal, but the gall bladder was felt greatly distended. The iliac incision was closed and another made over the gall bladder, which was discoloured and in a condition of gangrene, and contained a large amount of bile and 190 gall stones. A drainage tube was inserted, and about as many more stones were discharged during the following week. The temperature gradually fell to normal, and the wounds did well. In a week there was another rise of temperature, thought to be due to the impacted stone in the left ureter. The ureter was incised through the vagina, and the stone removed. Several ounces of pus, followed by a copious flow of purulent urine, followed its removal. Drainage was effected by a catheter passed up to the kidney, and this was irrigated several times daily. The patient's temperature fluctuated, and she grew weaker. Four weeks from the first operation, pus increased in the urine, and the temperature remained high. The right kidney was then incised, as the left kidney was draining freely through the catheter. The renal tissue was friable, and bled terribly. The patient's condition was so bad that no attempt was made to investigate the left kidney, and she died four hours later. Probably both kidneys were diseased before the first operation, but the urine analysis had been hastily made.

STENOSIS OF THE CERVIX AND FORNIX DURING PREGNANCY. DELIVERY PER VIAS NATURALES.

SCHENK (*Centralbl. f. Gynäk.*, Leipzig, 1900, No. 6) describes in detail the causes of acquired vaginal atresia, and quotes the statistics of Neugebauer and Esman, the latter finding 80 per cent. of cases of vaginal stenosis are due to difficult labour. Of the rarer causes he refers to vaginal injections of such substances as zinc chloride, carbolic acid, and chloride of iron, as therapeutic agents, or to procure criminal abortion. Under the latter heading, he quotes a case described by Levy, where criminal abortion was attempted at the fourth month by injecting a solution of sulphuric acid. The result was stenosis of the vagina, necessitating Cæsarean section. In this case the vaginal wall was expelled as a slough, with part of the cervix. The patient was 17, and in the fifth month of pregnancy. At the end of the second month she took large quantities of wine with cinnamon and saffron suspended in it, and hot vaginal douches. At a later period she received a vaginal injection of an unknown irritant solution, which caused necrosis of the vaginal walls and sloughing of the lower part of the cervix. The result was marked stenosis of the upper part of the vagina, and what remained of the cervix. Labour began before full time, and the small opening of the cervix being discovered, this was dilated by free lateral incisions; a foot was drawn down, and the after-coming head perforated, to permit of its passage through the stenosed vagina.

Schenk discusses at some length the indications for, and advantages of, Cæsarean section or Porro's operation in such cases, as contrasted with natural delivery after free incisions into the stenosed cervix and vagina, and quotes authorities in favour of each method of treatment.

PREGNANCY IN A PATIENT WITH A DOUBLE UTERUS AND VAGINA.

C. J. GLASSON (*Lancet*, London, November 4, 1899) reports a case of a primipara whom he saw for the first time at time of her confinement. She had been in labour some time, and the membranes were ruptured, but no progress was being made. The presenting head was felt through a thick membrane, but no os could be felt. On a second examination, the child's head was felt pressing on a thick band of tissue. On separating the labia, a thick septum was seen stretching anteriorly and posteriorly across the vagina. The pains becoming more powerful, the upper portion of the septum was torn through. By pressing the head to one side, it came down on the perineum, tearing the lower attachment of the septum. There was a mark across the child's head where it had pressed against the septum. Examination a month later showed that the external genitals were normal, but the remains of the septum still divided the vagina into two parts. Two uteri were felt, one to the left and one to the right, but only two ovaries were discovered. Menstruation had always been scanty and irregular.

NOTES ON THE ORIGIN OF SEX.

DAVENPORT (*Intercolon. Med. Journ. Australas.*, Melbourne, October 20, 1899) gives the results of his investigations on the above subject. He visited in Dublin between 400 and 500 families, containing no less than three children each, while some had more than twelve. A total of 2540 children was noted, consisting of 1313 males and 1227 females; and yet in some families all children were males and in others all females. The results showed that where male children predominated the mother was relatively more vigorous and in better health than her husband, and *vice versâ* where female children predominated. The author concludes that "the sex of the child is determined at the moment of conception, and is the opposite to whichever parent is at that moment in relatively the more vigorous health." The theory was tested by a series of experiments on dogs, keeping the male in confinement and on a limited diet, while the female had exercise and a bountiful diet. The result of conception after two weeks' treatment was a litter of five male pups. The conditions were reversed the following year, and females were the result. A prominent breeder in New South Wales said that when he desired to obtain a heifer, he stall-fed the bull, and turned the cow out to grass for a definite period, and had rarely been disappointed in securing a heifer.

The first experiment on man was made on a German who had eight children who were all boys. His wife was a woman of fine physique. He himself had come to Australia to check commencing pulmonary disease. The wife had to undergo a surgical operation which kept her in bed for three weeks, and during her illness her husband was placed on a generous diet, regular hours, and tonics. The result was that nine months later she gave birth to the desired daughter.

Since then the experiment has been tried in thirty-nine families, with success in thirty-two cases, while in four no conception occurred. All sexual intercourse is proscribed for one month. The weaker parent is then built up in every possible way. The stronger parent is correspondingly depressed by a low diet of non-nitrogenous food, a minimum allowance of sleep, with a maximum of sedentary or brain work, and two weeks of nerve sedatives, bromide, iodide, etc. At the end of the month, intercourse is permitted on the third day after cessation of menstruation.

THERAPEUTICS.

UNDER THE CHARGE OF

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Treatment of Chorea.

Adams (*Arch. Pediat.*, N. Y., 1899) advises in the treatment of chorea absolute rest, bland diet, and mild hydrotherapy. Arsenic given in large enough doses does more good than other drugs, but where a rheumatic element is distinctly present salicylate of sodium helps greatly. Where these fail Adams uses sulphonal or trional in 2-gr. doses every four hours for a 10-year old child.

Lichtschein (*Med. Rec.*, N. Y., 1899) in severe cases keeps the patient continuously asleep by giving chloral hydrate. Cure gradually occurs, and appetite and digestion are not impaired.

Rendle (*Brit. Med. Journ.*, London, 1899, vol. ii.), after treating a severe case of chorea with potassium bromide, arsenic, chloral hydrate, and morphine, with very slight success, gave hyoscine hydrobromide subcutaneously. Improvement began at once and continued, the last trace of choreic movement having gone at the end of a week.

Chronic Sulphonal Poisoning.

Dietrich contributes a review of the reported cases of sulphonal poisoning (*Therap. Monatsh.*, Berlin, April 1900). The drug was introduced by Kast in 1888, and since then thirty fatal cases have been described, and about fifty non-fatal severe cases. Considering how much sulphonal is used, Dietrich thinks this a small number, but doubtless many cases have passed unrecorded. They have all been chronic in character, and have occurred during the medicinal administration of the drug, mostly in lunatic asylums. The amount necessary to cause poisoning varies extremely—1500 grms. in six years, 224 grms. in 205 days, 893 grms. in 971 days, 128 grms. in ninety-one days, and similar amounts have frequently been taken without any ill effects. On the other hand, death has occurred after 16 grms. in one month, and 90 grms. in three months, and severe poisoning after 180 grms. in 270 days, 132 grms. in 120 days, and so on. Poisoning, therefore, does not depend directly on the amount taken, but probably to a large extent on the circumstances of the individual. Women are more commonly affected than men, and poor diet, age, and debility all increase the tendency. Constipation specially favours poisoning, as the drug has more chance of being largely absorbed. It is sometimes found unchanged in the urine. None of these points, however, sufficiently explain the predisposition of certain persons as compared with others.

The post-mortem changes throw no light on this either. Degenerative processes and hæmorrhages are found in the liver and kidneys and in other organs, and occasionally there is gastro-enteritis. Experiments on animals have given similar results.

The symptoms are first gastro-intestinal—colicky pains, vomiting, constipation—and at the same time a cherry-red colour of the urine. Soon ataxia, paresis, slow speech, and more or less stupor occur. The pupil and tendon reflexes are weakened or absent. The heart may suddenly fail, and cause death. A high temperature is often observed. The red colour of the urine is said to be due to hæmatoporphyrin, an iron-free derivative of hæmoglobin, but, according to Quincke, it is a new, hitherto undescribed pigment. Dietrich, however, says that he isolated a body from such a urine, which was undoubtedly hæmatoporphyrin. The urine is acid, and does not decompose, no matter how long it is kept. Albumin is present in about half the cases. Blood cells, bladder cells, and kidney tube-casts may also be found.

Sulphonal should never be given continuously, and its administration should be interrupted every five to seven days or thereabouts. If chronic poisoning do occur, purgatives and diuretics should be given to clear it out of the body. Alcohol and digitalis and other heart and circulatory stimulants should be given. Diuretin is specially useful. Large doses of sodium bicarbonate should also be administered to increase the alkalinity of the blood, while magnesium carbonate and potassium acetate are also useful. Vomiting, colic, and other symptoms must be treated by the usual remedies.

PHOSPHORUS IN OSTEOMALACIA.

LITTAUER discusses the causes and treatment of osteomalacia, in connection with two cases which he treated successfully with phosphorus (*Therap. Monatsh.*, Berlin, March 1900). Mosengeil in 1874 first used phosphorus in these cases, and Sternberg in 1892 published an account of several which he had cured by its prolonged administration. The result is not always satisfactory, especially in first cases during pregnancy; and sometimes apparently severe cases do much better than milder ones. The dose is $\frac{1}{120}$ to $\frac{1}{60}$ gr. per day to begin with, but up to $\frac{1}{12}$ gr. may be given with care, and best dissolved in cod-liver or almond oil. If phosphorus fail, oöphorectomy should be resorted to.

SALOL IN TAPEWORM.

GALL-VALERIO (*Therap. Monatsh.*, Berlin, March 1900) has treated a case of tapeworm successfully with a single dose of 15 grs. of salol, and without any preliminary treatment. Some hours after taking the salol a complete specimen of *Bothriocephalus latus* was passed.

ALCOHOL AS A FOOD.

NEUMANN has made a prolonged experiment on himself to determine the value of alcohol as a food (*Arch. f. Hyg.*, München u. Leipzig, 1899). The point to be determined was whether alcohol, like carbohydrates and fat, can protect the albuminous tissues from oxidation, and thus lessen body waste. He first brought himself into nitrogenous balance on a rigidly fixed diet, and then subtracted from it a certain amount of fat, which was replaced later by an equal quantity of alcohol in calories. The alcohol at first (for four days) increased the excretion of nitrogen, but from that time on it acted as a food and lessened the excretion. The explanation apparently is, that alcohol at first acts as a foreign body or poison, and that it is only used as a food when the system becomes accustomed to it.

Offer (*Wien. klin. Wchnschr.*, 1899), working under von Noorden, has reached similar results. He put himself on an insufficient diet, and, by adding either fat or alcohol to it, has sought to show that the latter was capable, like the former, of making it sufficient. With him also the alcohol caused at first an increase in the excretion of nitrogen, but this soon passed off.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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HAFFKIN'S ANTI-PLAGUE INOCULATION.

THE long-looked-for Report of the Indian Plague Commission is about to be published. Chapter iv. in final proof form has already been privately distributed, and deals entirely with Haffkin's Anti-Plague Inoculation. It treats of the subject in certain of its aspects in a highly critical and fairly exhaustive manner. A spirit of scepticism pervades its pages, and while a healthy scepticism is always welcomed by true scientists, there is always a risk of its going too far and becoming decidedly hostile. There will probably be many who will be found to be of opinion that this part of the Commission's Report has not kept free from this risk. It first considers the following points:—(1) The methods of preparing mass cultures of the plague bacillus. (2) The method of controlling the purity of these cultures. (3) The method of killing the plague bacilli with the view of converting the culture into an immunising material. (4) The method of decanting and bottling the prophylactic fluid. (5) The method of ascertaining that the vaccine is free from micro-organisms, and the precautions which are adopted for preventing the growth of such organism. (6) The method of standardising the vaccine. (7) The composition of the vaccine. (8) The volume of the prescribed dose. It may be recalled that Haffkin prepares mass cultures of the plague bacillus in a medium obtained by digesting goats' meat in the autoclave at 140° C. with hydrochloric acid, and then neutralising the medium with caustic soda. Proper aeration is secured by the addition of a small quantity of oil, which floats as small drops upon its surface. The bacilli grow downwards into the medium in stalactite formations, suspending themselves from the oil drops. The cultivation is carried out at the room temperature, which is not allowed to fall below 25° C. The flasks are cultivated in this way for several weeks, the culture being shaken up every few days, so that the bacilli fall to the bottom of the fluid and new stalactite formations appear. The report has nothing but praise for this method. The purity of the mass cultures is obtained in the usual way, but the method of controlling the purity of the cultures of the resulting growths, merely by the naked-eye appearance of the colonies of plague bacilli, seen from behind by the reflected light through the depth of the agar, does not gain the approval of the Commissioners. However effective it may be in the hands of an expert like Haffkin, it is not suitable for general adoption. The method of killing the culture employed by Haffkin is the routine one, and appears to them to be, in the case of plague, as in the case of other non-spore-bearing organisms, absolutely trustworthy. The method of decantation and bottling is considered faulty, inasmuch as contaminations were found in a certain percentage of the stored bottled vaccine ready for use. This must be condemned in principle, as contamination may introduce injurious substances into the body, but Haffkin's prophylactic has been extensively used, and it was therefore easy to determine whether such contamination, as is occasionally present in the vaccine, is injurious or not. Haffkin himself claims that it is not, and that the good and evil results of inoculation must be judged, not from experimental data obtained in the laboratory, but rather from the results which have been actually obtained in man. The Commissioners support this contention, and declare that they have not had any evidence laid before them which goes to show that any serious ill consequences have resulted from the defect in sterility. They think, however, that it could be possible by resterilisation of the bottles, at 60° C., to send out the vaccine in a perfectly aseptic condition without forfeiting anything of its efficacy.

The method of standardising adopted, namely, the direct method of determining the toxic effect on man—an average temperature of 102° F. on a series of ten to twenty patients—is criticised adversely by the Commissioners. They admit that they have no data at their disposal for arriving at a judgment as to whether the attainment of that temperature is in reality an index of the acquirement of immunity, but on *a priori* grounds they think it untrustworthy, inasmuch as the vaccine contains, in addition to the poisons which are specific to the plague bacillus, other fever-producing poisons in the form of considerable quantities of peptone. Their inquiries revealed that this method of standardisation was not always carried out, but that the doses prescribed on the bottles were often arrived at by estimating the opacity of the particular vaccines, when certain sample bottles of these were held up to the light. It became necessary to determine the relative immunising power possessed by the bacterial sediment and the supernatant fluid respectively. They come to the conclusion that the injection of the bacterial sediment does produce immunity in the case of animals. This immunity may be absolute where the test quantum of plague culture which is introduced into the organism does not exceed a very small minimum, as the plague bacilli are destroyed before they can produce any noticeable symptoms. In other cases, when the test quantum of plague culture introduced is somewhat larger than the maximum quantity which the system is capable of effectually dealing with, a mere modification of the plague attack is obtained. Further, the supernatant fluid does not lead to the elaboration of any substances which are capable of favourably modifying a plague attack. It neither confers upon animals any immunity, nor does it reduce mortality. By eliminating it from the vaccine, several advantages would be attained. Inoculation would be easier. There would be less risk of contamination, and the vaccine would be free from peptones. They then pass to the main subject, which takes up by far the greater part of the Report, namely, the results which have been obtained in actual practice by its application. An immense mass of evidence, figures and statistics, is here dealt with, in the hope of reducing to accurate numerical expression the saving of life which has been brought about by inoculation. There is an immense difference between the conclusions arrived at by the Commissioners and Mr. Haffkin. To take an instance, in Undhera the diminution in mortality which was actually effected among the inoculated was, according to the Commissioners, 5·3 per cent.; according to Mr. Haffkin, 89·6 per cent. They allow that his method of calculation correctly represents the percentage which the number of lives saved by inoculation bears to the maximum number of lives that might have been saved, and he takes as the maximum number of lives that might have been saved a number corresponding to the number of lives actually lost on account of plague among the uninoculated. They think this method, if read apart from the actual figures to mean that the reduction in the mortality produced by inoculation is between 80 and 90 per cent., is capable of much misunderstanding. They have therefore adopted a method of expressing their results which they think is not open to this objection, namely, the ratio which the deaths among the uninoculated stand to the deaths which actually occurred among equal numbers of the inoculated. This is no doubt satisfactory enough for those who go into the facts for themselves and understand what is meant, but those who take the mere figures themselves will be apt to form conclusions much further from the truth than Haffkin's method would have led them. It is to be remembered that Haffkin had to impress upon the native mind, averse to inoculation, the great advantages to be derived from its adoption; and that these advantages are great the Commissioners have themselves demonstrated. A brief summary of their results will show this:—(1) Inoculation sensibly diminishes the incidence of plague attacks on the inoculated population, but the protection which is afforded against attacks is not absolute. On the one hand, plague has attacked persons who have undergone inoculation as many as four times in the course of two years previous to their attack. On the other hand, as many as 8 per cent. of the inoculated population may suffer from plague, as was the case in Bulsar. Many varying influences may have been at work in determining the rate of attack in different places, and it is impossible to give a numerical expression to the measure of protection against attack which inoculation confers. (2) Inoculation diminishes the death-rate among the inoculated population. This is due not only to the fact that the rate of attack is diminished, but also to the fact that the fatality of attacks is diminished. Here, again, no numerical expression for the amount by which the death-rate is diminished can be given. (3) Inoculation does not appear to confer any great degree of protection within the first few days after the inoculation has been performed. This fact has an important bearing on the risk of infection which would be incurred by recently inoculated persons, if they were left behind in surroundings so plague-infected as to render their evacuation by the uninoculated desirable. (4) Inoculation confers a protection which certainly lasts for some considerable number of weeks. It is possible that the protection lasts for a number of months. The maximum duration of protection can only be determined by further observation. (5) The varying strength of the vaccine employed has apparently had a great effect upon the results which have been obtained from inoculation. There appears to be a definite quantum of vaccinating material which gives the maximum amount of protection; and provided that this quantum can be injected in one dose, and provided also that the protection turns out to be a lasting one, reinoculation might with advantage be dispensed with. The best results of inoculation will only be obtained after an accurate method of standardisation has been devised. (6) They are further of opinion that inoculations, under certain safeguards and conditions, should be encouraged wherever possible.

Practical men, who know the natives of India and their ways and customs, may well doubt if the Commissioners have taken the best way to bring this about. If this Report were for scientific inquirers alone, there could be no doubt of its value, but as it will have a wide distribution, there is room for fear that it will do much harm, especially among prejudiced persons. If it leads to any diminution of inoculation, which is much to be feared, then it may be instrumental in greatly hampering the life-saving work of Mr. Haffkin, a result which would be deplored by all, as by the Commissioners themselves. It is to be sincerely hoped that the conclusion which they come to in their Report will in some measure prevent this. It is as follows:—"We cannot bring to a conclusion this consideration of anti-plague inoculation by Mr. Haffkin's prophylactic fluid, without expressing our sense of the importance of the method which Mr. Haffkin has devised and of the results which have been achieved by it. The credit due to Mr. Haffkin is the greater, because the difficulties with which he had to contend in this matter could only have been overcome by great zeal and endurance. Mr. Haffkin's work on Anti-Plague Inoculation, while not based on any new scientific principle, constitutes, it seems to us, a great practical achievement in the region of preventive medicine."

MALARIA.

WOLDERT contributes a useful paper (*Proc. Path. Soc. Phila.*, February 1900, p. 103) on some new methods of staining the sporozoa of malarial fever. Like many other writers, he prefers to examine the fresh malarial blood, as it offers the best opportunity for observing the movements and characteristics of the hæmatozoon and its contained-pigment granules. It is more accurate than the stained method. The latter has, however, a most important place, and it is imperative that the observer should be conversant with the various methods of handling and treating dried films of malarial blood to the best advantage. The first of his new methods is that devised by Futcher and Lazear, and is described as follows. Two solutions are required, first a fixation fluid, and second a staining fluid:—

Fixation fluid.—It consists of a ¼ per cent. solution of formalin in 95 per cent. of alcohol, made immediately before using.

Staining fluid.—Saturated solution of thionin (Cogit) in 50 per cent. alcohol, 20 c.c.; 2 per cent. aqueous solution of carbolic acid, 100 c.c. Thionin phenate is probably the product formed, and is the staining agent. The staining fluid should be kept for some time before it is used. The supernatant fluid only should be employed. The method of staining is as follows:—Prepare blood films in the usual way, and, after thoroughly drying in the air, place in the fixation fluid for one minute, wash in water carefully (but never under a hydrant), dry thoroughly, and stain for fifteen seconds, wash in water, dry and mount in Canada balsam. The red cells take on a faint greenish tinge, the malarial parasites and nuclei of the leucocytes a reddish violet colour. The entire procedure can be completed within two to three minutes. It is said that Grübler's thionin does not act so favourably as that of Cogit. There can be no doubt that this is a most excellent method. I cannot say whether the author is right in asserting the superiority of Cogit's thionin over Grübler's, but I have used ordinary carbol-thionin (Grübler) in the following preparation:—Thionin, 1 grm. carbolic acid, water (1 to 40), 100 c.c., the blood films having been fixed in any of the ordinary methods, with excellent results, the same selective staining results having been obtained as those by the author's method.

The other method found valuable in the author's hands was as follows:—The blood films were fixed by heat, other methods of fixation proving unsatisfactory. The following stains were made:—

Solution No. 1.—Toluidin-blue, 15 grs.; distilled water, 4 drms.

Solution No. 2.—Acid-fuchsin, 15 grs.; distilled water, ½ drm.

Solution No. 3.—2 per cent. aqueous solution of eosin.

To solution No. 1 add twenty drops of solution No. 2, and afterwards twenty drops of solution No. 3. A precipitate is formed, and in staining only the supernatant fluid is to be used. The mixed solutions are used for five minutes. The film is then washed in water, dehydrated, clarified, and mounted in Canada balsam.

HÆMATURIA FROM A HEALTHY KIDNEY.

CASES occasionally arise in which profuse and frequent hæmorrhage is traced to a kidney which shows little or no evidence of disease when it comes to be examined. Some such cases are perhaps due to "movable" kidneys, since the hæmorrhage has ceased when the kidney has been fixed; the hæmorrhage having been possibly due to the mobility of the kidney being so great as to occasionally cause kinking of the vein, and consequently very great venous congestion of the organs. Myles (*Med. Press and Circ.*, 23rd August 1899) gives notes on the case of a woman, æt. 26, who began to suffer from recurrent attacks of pain in the middle line and left side of the abdomen, shortly after an operation for hæmorrhoids in 1898. The pain travelled down towards the thigh, and simulated a renal colic. It was not very severe, and though at first intermittent, became later nearly constant. It was accompanied by hæmaturia of great severity, which caused progressive emaciation and anæmia, the loss of weight amounting to 28 lb. in two months. Both kidneys were movable, particularly the left. The right gave no pain on palpation, but the left was very tender when pressed downwards and forwards. The urine was almost pure blood during the hæmaturic attacks, but at other times was practically normal. No tubercle bacilli were ever found. On examination with the cystoscope, the blood was seen to come from the left ureter. On medical treatment failing, surgical interference was resorted to, and the kidney fixed about two months after the time of her first visit. The hæmaturia continued as before, and the kidney was then removed, and the patient made a complete recovery. On examination, its substance was apparently quite normal, but the mucous membrane of the pelvis was red, thickened, and pulpy, and covered with minute papilliform elevations and rugæ which gave its interior a curiously roughened appearance. On microscopic examination, myxangiomatous changes were found in the submucous tissue of the pelvis, and it was thought that the hæmaturia had been caused by them. It will be interesting to note if this should find corroboration in future cases.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

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SOME POINTS IN THE TREATMENT OF CHRONIC MIDDLE EAR SUPPURATION.

THE frequent discussions and papers dealing with this most common affection sufficiently indicate the difficulties which are daily met with in the attempts to effect its permanent cure. It is unnecessary to say anything at this time of the dangerous complications which may arise in the course of a chronic suppuration of the middle ear, as we have alluded to such on previous occasions. At the present moment the attention of the reader is asked to the question of the treatment of a persistent suppuration, under the following three heads—(1) Through the external auditory meatus by syringing and packing of the canal; (2) through the same channel, by removal of the remains of the tympanic membrane and two larger ossicles; and (3) by the radical operation through the mastoid process.

1. *Syringing and packing of the external auditory meatus.*—In the *Edin. Med. Journ.*, June 1898, Arthur H. Cheatle gave a detailed account of a method of purifying the meatus, which afforded most gratifying results in the carrying out of various operations upon the tympanic membrane and the external auditory canal. By adopting a similar procedure, followed by the introduction of an antiseptic dressing right down to the diseased area, the author has obtained excellent results in the treatment of chronic middle ear suppuration. At a recent meeting of the Otological Society of the United Kingdom (*Journ. Laryngol.*, London, March 1900) Professor Urban Pritchard has again brought this subject under the notice of the profession, and the following extracts from his paper will prove of interest. The ear is syringed out with carbolic acid, 1–40, after which the meatus and the auricle are carefully cleansed with the same lotion, but used at a strength of 1–20. The application is made to the meatus by means of mops, the double cyanide gauze moistened in the lotion serving this purpose. After the cleansing has been thoroughly carried out, a narrow strip of the double cyanide gauze, well wrung out either in 1–20 or 1–40 carbolic, so as to get rid of the irritating soluble cyanides, is carefully passed down into the deepest part of the meatus, so as to occupy probably its inner two-thirds. On

the top of this another strip is laid, so that the whole meatus is thus completely filled. The dressing should be repeated—the same steps being employed for cleansing—once a day or once in two, three, or more days, according to the condition of the case. This interval may be gradually lengthened, the gauze being left in for ten days or a fortnight after the discharge has ceased. Even after that it may be advisable for the patient to wear for some weeks a piece of gauze, introduced into the outer part of the meatus, and occasionally changed. The duration of this treatment varies in different cases, but if favourable, the discharge rapidly diminishes and becomes sweet, so that the gauze is removed dry and free from odour.

2. *Removal of the remains of the tympanic membrane and larger ossicles through the external auditory meatus, in chronic middle ear suppuration.*—Since the introduction of this operation, many excellent results have been obtained in the treatment of chronic otorrhœa, results which justify it as a recognised procedure. It may not be out of place to state here that the operation may be undertaken either with the view of removing the cause of a persistent suppuration, or with the object of improving the hearing, in cases in which the discharge has already ceased, a result which may have been brought about by simpler means. At the same time this important fact must not be lost sight of, namely, that improvement in hearing very frequently follows in those cases in which the operation is undertaken mainly with the view of curing the discharge. The cases in which this line of treatment is indicated may be said to form an intermediate group between those responding satisfactorily to simpler treatment, and those, on the other hand, in which the symptoms and signs indicate further extension of the disease, and demand the radical operation through the mastoid process. The indications for removing the remains of the tympanic membrane and ossicles may be more accurately defined thus: cases in which there is a persistent discharge through a perforation in Shrapnell's membrane, indicating attic trouble; cases with a persistent discharge through a perforation in the posterior-superior quadrant of the membrane so frequently associated with caries of the incus; and less frequently perforation in some other part of the membrane. One of the best accounts of this method of treatment is furnished by Arthur H. Cheatle, in *Practitioner*, London, 1898, and the reader will find there a more detailed account of the subject than can be given in a brief summary of this kind. Lake of London has recently (*Lancet*, London, 10th March 1900) tabulated his results in fifty cases of chronic middle ear suppuration. The operation has proved very successful, has been entirely free from any danger to health, and the hearing has often improved, and rarely if ever has diminished. He lays particular stress upon the necessity of removing the outer attic wall. The malleus and incus are removed, and granulation tissue is scraped, and the cavity thoroughly cleansed with Lister's strong solution. Out of the fifty cases thus treated, forty-two were cured, the discharge ceasing; in three of these there were temporary relapses; in the remaining eight the patients disappeared before cure was effected. In twenty-one cases, improvement in the hearing power was noted. The average duration of the disease in these patients was thirteen years.

3. *The radical operation in chronic suppuration of the middle ear.*—Having dealt thus briefly with the conservative treatment of persistent middle ear suppuration, as illustrated in one or two recent papers, we may with advantage turn to those cases which demand more active treatment.

The importance attached to the question of opening the mastoid in chronic middle ear suppuration was shown by the selection of that subject for discussion at the Sixth International Otological Congress, held in London in August of last year (*Journ. Laryngol.*, London, October 1899). The discussion, which was opened at that meeting by Politzer, Macewen, Luc, and Knapp, deserves the careful consideration of all surgeons. As this short review deals with treatment, we will content ourselves by merely referring the reader to that discussion for an exposition of the views there expressed as regards the indications for the major operation. The method of carrying out the mastoid operation for the cure of chronic purulent otorrhœa has been still more recently discussed at a meeting of the Royal Medical and Chirurgical Society of London, held on 23rd January and 13th February 1900. An extremely interesting and valuable contribution was made to this subject by Charles A. Ballance, who described and illustrated the immediate healing of the cavity left in the bone as the result of the operation by means of epithelial grafts. At the beginning of his paper the author points out how the operation that is applicable in chronic disease, is inapplicable in acute cases. It is unfortunately still necessary to emphasise this point. In acute cases in which a mastoid operation is necessary, only the antrum, or the antrum and such mastoid cells as may be suppurating, should be opened; the tympanum and the external auditory meatus must be left undisturbed. The object aimed at by the surgeon in these cases is to establish free drainage and arrest the inflammatory process. The function of the organ must be duly kept in mind, and there must be no attempt to injure the delicate structures of the middle ear. In cases of chronic suppuration, on the other hand, we have a different state of affairs to deal with, and the only rational treatment in such cases, once it has been decided that an operation through the mastoid should be performed, is to open up fully and extensively the diseased bony cavities, and to secure the complete removal of all diseased tissue. To thoroughly effect this, not only must every focus of disease be removed from the mastoid, the antrum, and the tympanum proper, but these various cavities must be thrown into one, by the removal of the bridge of bone which overhangs the communication between the antrum behind and the attico-tympanal cavities in front. This further admits of the removal of the outer wall of the attic, which is formed by the bone at the inner end of the roof of the external auditory meatus, and enables this cavity to be thoroughly dealt with, along with certain cells which extend from the attic into the meatal roof. The complete exposure of the parts and the removal of all disease fulfils the first condition of the operation (we need not detail this here); the healing of the large bone wound from the bottom constitutes the second condition. This object may be attained by the epithelial grafting of the tegmina antri and tympani, of the inner walls of the antrum, attic, and tympanum, and of the fresh-cut bone forming the anterior and superior walls of the inner extremity of the enlarged osseous meatus. For this purpose a second operation is carried out by Ballance, at a varying period after the first. In the case of children this is undertaken at the end of one week, and in adults at the end of ten days, two weeks, or even three, depending upon the covering of the bony cavity by a layer of healthy granulation tissue. The day before the second operation the plug is removed from the external meatus, and the cavity is irrigated several times with 1 in 40 carbolic lotion. On the morning of the operation it is washed out three or four times with warm sterile normal saline solution. The original incision behind the ear, which had been sutured throughout at the first operation, is again opened and the pinna displaced forwards. After the bony cavity has been carefully and gently dried by means of gauze mops, large epithelial grafts are taken from the thigh or arm of the patient. The roof of the antrum and attic, and the inner wall of the antrum, are easily covered with one large graft, but the chief difficulty lies in the attempt to apply it to the inner wall of the tympanum. In order to adjust the grafts to the bone, Ballance makes use of steel lifters, such as are employed for lifting microscopic sections. Small pieces of moist gauze fixed on angular forceps are then used to press the graft firmly against the bone, while small probes, with pear-shaped heads, 6 or 4 mm. in diameter, are of good service for a similar purpose when the irregular recesses of the bone cavity are being dealt with. Particular stress is laid upon the necessity of grafting the fresh cut surface of the superior wall and the upper portion of the anterior wall of the enlarged osseous meatus.

As a protective to the grafts, the author has, after various experiments, found pure gold leaf a suitable material. It can be easily sterilised; it is soft, and can be adapted to the irregularities of the cavity, and it is not acted upon by the living tissues. After the gold leaf has been placed in position, a narrow strip of dry iodoform gauze is inserted, and the mastoid flap is again completely closed and the external dressings applied. A week later the plug is removed, while the gold leaf is left undisturbed for three or four more days, after which it is removed with forceps, the parts being first gently irrigated. The author holds that the after-treatment of cases operated upon by the radical method is much curtailed by this system of grafting, and that to the surgeon and patient alike the results prove much more satisfactory.

EPISTAXIS FROM THE ETHMOIDAL VEINS.

SPONTANEOUS hæmorrhage from the nose has its seat of origin most commonly in the lower and anterior part of the cartilaginous septum, from an area that can be observed without difficulty by anterior rhinoscopy, and to which the necessary treatment can be satisfactorily applied. This, however, is not the only site of intra-nasal bleeding; and recently attention has been drawn by Brown Kelly of Glasgow (*Lancet*, London, 24th February 1900) to a hitherto unrecognised source of hæmorrhage, namely, from the anterior ethmoidal vessels. As the recognition of the true source of the bleeding in these cases has an important bearing upon the treatment of the same, Kelly's observations are worthy of detailed study. Four cases are recorded, in which the hæmorrhage evidently took place from the roof of the nose, or from the septum above the anterior end of the middle turbinate. In all the cases the bleeding was severe, and the attacks recurred at intervals. Examination of the interior of the nose showed in three of the cases the blood flowing from above the anterior end of the middle turbinate, while in the fourth the cessation of the blood-flow, after the introduction of a suitable plug between that bone and the septum, indicated that in this case too the bleeding took place from the same locality. Additional evidence was forthcoming in two of the cases, from the fact that the stream was observed to descend over the septum. That the bleeding was of venous origin rather than arterial, was suggested by the fact that in one case the onset occurred when the patient was asleep; in another, when he was stooping; in a third, while the patient was lying quietly in bed; and in the fourth, during the act of washing the feet.

It is interesting to follow Kelly's inquiry into the possible etiology of epistaxis from this source. The anterior ethmoidal veins, which are not the largest in the nose, are situated high up in the most secluded and best protected part of the cavity, and therefore from their position no reason can be found to explain their tendency to bleed. They differ, however, from the other veins of the nose in their close connection with the intracranial circulation, and it is in this point that the writer seeks to find the explanation of the profuse and prolonged hæmorrhage in the cases which he has reported. The ethmoidal veins anastomose with the veins of the dura mater and with the superior longitudinal sinus. These veins can be injected from the longitudinal sinus, thus proving the absence of valvular obstruction to a backward flow. This fact, taken in conjunction with the blood pressure in the sinus, which has been shown by Leonard Hill to follow closely the general circulatory pressure, would allow of abundant hæmorrhage from the proximal end of a ruptured ethmoidal vein. This connection between the nasal and intracranial veins would explain the sense of relief in the head which is sometimes felt after bleeding from the nose.

The practical application of Kelly's observation is found in the mode of inserting the plug, in order to control the bleeding. This should be done by firmly packing the gauze strip into the interval between the septum and the anterior end of the middle turbinate, carrying it as near to the roof of the nose as possible. Such a plug serves the purpose, while the lower part of the nasal fossa is thus left free, so that respiration may go on unimpeded. This increases the comfort of the patient in a marked way, and it further renders unnecessary that most disagreeable operation of plugging the posterior nares. The packing may be changed once or twice at intervals of a day; or, if it can be introduced without becoming saturated with blood, it may be left in for two days, and then finally withdrawn if all tendency to hæmorrhage has ceased.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Carburetted Water Gas.

The evidence given before the Committee on the Manufacture and Use of Water Gas (Report, 1899), and the paper by Dr. Haldane on the risks attending its use (*Pub. Health*, London, April 1900), contain much of interest from the point of view of public health.

Water gas consists of a mixture of hydrogen and carbonic oxide, and is produced by driving steam over white-hot coke. It, however, burns with a non-luminous flame, and, unless when used with incandescent burners, is useless for purposes of lighting. By passing water gas through a strongly heated chamber, into which petroleum oil is injected, this latter is converted into a gas which, mixing with the water gas, produces a mixture burning with a luminous flame, and called carburetted water gas. The composition of carburetted water gas as well as of coal gas varies, the former with the amount of petroleum used, and the latter with the kind of coal used in manufacture. Dr. Haldane gives the following as an average:—

	Coal Gas.	Carburetted Water Gas.
Hydrogen	50 per cent.	35 per cent.
Marsh gas	35 ,,	20 ,,
Carbonic oxide . . .	7 ,,	30 ,,
Ethylene	4 ,,	10 ,,
Nitrogen	...	...

London coal gas contains about 5 per cent., while Edinburgh coal gas contains about 10 per cent. of carbonic oxide.

Water gas has no smell, but carburetted water gas has as pungent and recognisable an odour as coal gas. Sir Henry Roscoe recommends the addition of a trace of mercaptan to water gas, to make an escape detectable. The use of carburetted water gas was introduced for the purpose of enriching coal gas, as it is found difficult, and in some cases impossible, to get the requisite candle power from coal. But, besides this, the plant can be brought into operation more quickly than coal gas plant, in the event of a sudden increase in the demand, *e.g.* a sudden fog. This gas is largely used in America, where, in 1896, it formed 70 per cent. of the whole gas used as an illuminant; in the city of Boston it forms 90 per cent. In Britain there is much less used, though the amount is increasing. In some parts of London it is 33 per cent., and in many places above 24 per cent. In America, along with the increase in the use of this gas, there has been an increase in the number of deaths by gas inhalation. The statistics from Boston are quite reliable, as, by an Act of the Legislature in 1888, such deaths must be annually reported by the Gas Commissioners. In 1889, with practically no water gas in use, there was one death, while in 1896 there were thirty-one deaths from this cause. As regards Great Britain, the Committee state "that it is impossible to ascertain with strict accuracy the death-rate from gas poisoning, either before or since the introduction of water gas," and "though there are not a few fatal cases, which were clearly caused by illuminating gas containing a greater or less proportion of carburetted water gas, no very satisfactory conclusion as to the effect of water gas can yet be drawn from the facts and figures available."

The poisonous effects of coal gas and carburetted water gas are due to carbonic oxide. Sir Henry Roscoe and others expressed the opinion that these effects are, in part at least, produced by some of the hydrocarbons present. To throw light on this matter, the committee instructed Dr. Lorraine Smith to investigate the subject for them. The results of his experiments, briefly stated, are—(1) That an atmosphere containing coal gas is only poisonous to animals when there is sufficient to make the percentage amount of carbonic oxide in the atmosphere equal to that which experiments with pure carbonic oxide have proven to be fatal; (2) that the other constituents of coal gas, when present in such quantity as would occur in an atmosphere made just poisonous by coal gas, are innocuous to animals. Acetylene must be present to the extent of 20 to 30 per cent. before it has any effect.

The products of combustion of carburetted water gas are the same as those of coal gas. Very slight escapes, caused by imperfections in the joint of fittings or burners, "would not become formidable by the introduction of water gas, as it is practically impossible for a really poisonous atmosphere to be produced by such escapes, though constant exposure to small leakages may be to some degree prejudicial to health." The danger is practically confined to cases of large escapes into rooms when persons are asleep, *e.g.* the unnoticed turning on of a tap again which has been turned off, the extinguishing of the light by stoppage of the pipes or turning off at the meter, and the renewed flow of gas without the tap being turned off, and to breakages or leaks in mains and service pipes, whereby gas has percolated — sometimes becoming deodorised—through the earth into a house.

Haldane considers that an atmosphere containing more than 0·2 per cent. carbonic oxide entails risks to life, while an atmosphere containing ·05 per cent. causes only giddiness on exertion in a healthy person, however long the exposure may be. He calculates that in a bedroom (say 500 to 1000 cubic ft. capacity, and with unfavourable conditions as regards ventilation) the higher percentage could not be attained with gas containing 5 per cent. carbonic oxide, escaping at the rate of 10·6 cubic ft. per hour (Bray's burner, No. 5), but with a gas containing 10 per cent. and above it would be exceeded. He considers "that it is clear that with coal gas of ordinary composition it is almost impossible to produce a poisonous atmosphere in a room by simply leaving the gas turned on during the night, whereas with water gas a poisonous atmosphere is easily produced even in large rooms." The substitution of carburetted water gas for coal gas, or its mixture with coal gas, would increase the risk of fatal accidents much more than the increased percentage of carbonic oxide expresses, since it is possible to attain by an escape of coal gas a percentage of carbonic oxide in the air of a room *approximating* to the lethal percentage, most accidents occurring during sleep. His practical conclusions are—(1) That it should be clearly realised that the dilution of carburetted water gas with coal gas very greatly reduces its danger; (2) that small rooms without fire-places, *e.g.* small bed-rooms in hotels and lodging-houses, should have the gas supply cut off; and (3) that since ordinary burners can pass double the amount of gas that is needed for the maximum light they can give, these should in bedrooms be replaced by some form of moderator burner. By this means the possible escape will be greatly diminished. The committee recommend that before any kind of water gas be distributed in any place, due public notice be given; that the amount of carbonic oxide present should never exceed 20 per cent., that is equal to 50 per cent. of carburetted water gas, and not above 12 per cent. at night. On account of the very imperfect and unsatisfactory gas-fittings often used in the poorer class of houses in large towns, and the constant leakages which take place, they think that power might be given to local authorities to enforce a standard of new fittings, and to inspect such fittings when required.

THE SANITARY CONDITION OF OYSTER BEDS IN FRANCE.

Dr. MOSNY (*Rev. d'hyg.*, Paris, 1899, No. 12, and 1900, Nos. 1, 2, 3) communicates the results of his investigation, carried out at the request of the Minister of Marine.

Restricting his inquiry almost entirely to fattening beds and market beds or ponds, he divides them into two classes—(1) Those situated at the mouths of tidal rivers; (2) those situated in the neighbourhood of harbours. Taking into account the self-purification of rivers, he considers that "the contamination of a tidal river by town sewage, at a point twelve to eighteen miles above the lowest tide-mark, does not seem to constitute a serious danger to oyster beds at its mouth." The purification of contaminated river water depends largely on sedimentation. At time of high tide, or when winds blow strongly up the river, this sedimentation is interfered with. He recommends that sewage should be discharged into such rivers during the first half of the ebb tide, and that the beds be so placed that they are uncovered during the last part of the ebb and the first part of the flowing tide. By these means the oysters will not be affected by the sewage water when it is least diluted. Each individual case will require special investigation, according to the amount of sewage entering the estuary, its size, and the situation of the beds.

He states that oyster beds at the mouth of tidal rivers in France are in a very satisfactory condition, and much superior in every case to those in Britain. The rivers which have large populations on their banks at a short distance from the sea have no oyster beds. The beds placed near harbours of large seaports, *e.g.* Toulon, are liable to much contamination. The sea water purifies itself very readily, however, and at about two miles from the shore, or even nearer, beds might safely be laid down. The great oyster culture establishments in France, *e.g.* those in the Bay of Morbihan, are quite free from any suspicion of contamination whatever.

REPORTS OF THE MEDICAL SOCIETIES.

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GLASGOW PATHOLOGICAL SOCIETY.—*9th April* 1900.—The President, Dr. **THOMAS BARR**, in the chair.—Dr. **JAMES FINLAYSON** showed specimens from a case of Hodgkin's disease. These comprised masses of enlarged lymphatic glands, extending from either side and below the tongue down into the anterior and posterior mediastina. The left lung was compressed, and a mass of glands bulged into the pericardium. A nodule was situated in the wall of the right ventricle. The tonsils and thyroid body were much enlarged. A mass was situated below the liver, and extending into Scarpa's triangles. Indications of tumour were present in the kidney. There was enlargement of the intestinal glands. The stomach showed wavy masses, white nodules were present in the spleen. The patient, æt. 39, had a history of a "lump" having appeared twelve months previously in the right groin. Loss of flesh and weakness supervened. The family history pointed to tuberculosis. He had occasional spurts of fever without a cause. He left practically well after arsenic, afterwards combined with iron. A fortnight later he "caught cold," and was sent into hospital again with a diagnosis of pneumonia, and with high temperature, cough, dyspnœa, and prostration. Dulness was present over left side of thorax, with faint and tubular respiratory murmur. Tumour in mediastinum was suspected. He had great stiffness about the tongue and throat, from the pressure of glandular masses. There was no leucocythæmia. Enlargement of the spleen was not determined, and there was no albuminuria. He died in the end of March. The masses were examined microscopically by Dr. M. L. Taylor, who found the essential change to be a replacing of lymphoid by fibrocellular tissue. Professor Muir had also seen the microscopic sections, and considered the appearances to have a closer relation to an infective condition than to a true tumour growth. In some respects the condition was analogous to tubercle.—Mr. G. H. **EDINGTON** showed for Professor **HECTOR CAMERON** a specimen of sarcoma of the os calcis. The tumour involved the under surface of the bone, and, while showing hæmorrhagic characters to naked eye, was found microscopically to be composed of round cells enclosed in alveoli of fibrous tissue. The part had been removed by Carden's amputation, from a woman æt. 68. A skiagram (by Dr. Mackintosh) was shown, in which the tumour was distinctly seen contrasting with the shadow of the remainder of the affected bone.—Mr. **JOHN ROWAN** showed a specimen of melanotic sarcoma of the choroid, for which he had enucleated, in a woman, æt. 69. The patient suffered from cataract, so that ophthalmoscopic examination could not be made. Examination of the enucleated eye showed it to be the seat of a large melanotic sarcoma of the choroid, infiltrating and displacing the retina.—Dr. **MUNRO KERR** showed a large dermoid ovarian cyst with a peculiar thickening at one part of the wall. The cyst had been removed by Professor Murdoch Cameron. The interest in the specimen lay in the nature of the thickening in the wall. This contained groups of epithelial cells, and one was almost forced to look upon the mass as carcinomatous.—Mr. G. H. **EDINGTON** showed—(1) Specimen of old fracture at elbow, complicated by a recent one of shaft of the ulna; (2) comminuted fracture of astragalus, with fracture of external malleolus, scaphoid, and os calcis; (3) photograph of case in which defective development of forearm was present, along with talipes and mental weakness.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*6th April* 1900.—Dr. R. KENNEDY showed—(*a*) A man who was operated on for cicatricial compression of the brachial plexus, causing total paralysis of the arm. Ten weeks previous to the operation the patient had received a dislocation of the shoulder-joint, and fracture of the surgical neck of the humerus, which was followed by atrophy of the deltoid, biceps, triceps, and muscles of the forearm, with diminishing sense of touch, and pain increasing in degree from above downwards. At the operation the vessels and cords of the brachial plexus were found tied down by soft callus, and were dissected out from it. On the following day the sense of touch but not of pain had returned. The first sign of voluntary power in the muscles returned in the thirteenth week. Now, in the fourteenth month after operation, sensation is complete; the muscles have all regained their normal power, unless the small muscles of the hand, and in those faradic irritability is returning. (*b*) Photographs of a case of brachial plexus paralysis, in which compression was due to a large axillary aneurysm. Antyllus' operation was performed. There was a return of sensation on the following day. The patient died three months later from pulmonary phthisis; but before death sensation was completely, and motion partially, restored to the limb. (*c*) A boy whose ulnar nerve was sutured three months after division, who recovered sensation on the day following, and who has now full use of his hand. (*d*) Two patients whose median nerves were sutured—(1) A man, æt. 37, was operated on one month after the accident. It was found that the nerve was divided in only two-thirds of its thickness. Apposition of the thumb was possible eight weeks after operation. (2) Was operated on three months after division of the nerve. He was able to return to employment a few months after operation.—Drs. J. M'GREGOR ROBERTSON and J. M'KENDRICK demonstrated a method of making blood films, and showed a series of microscopic preparations more especially illustrating leucocythæmia. The slide or cover-glass is prepared by immersion in sulphuric acid, water, and ether. The skin, which should be rendered aseptic, is punctured so that the blood flows freely. Touch the drop of blood with a cover-glass, and slide another cover-glass over it. Dry in air or pass through the flame of a spirit lamp. Immerse cover-glass in equal parts of alcohol and ether from two to five minutes or longer; pass into eosin for fifteen seconds to one minute, and counter-stain with methylene-blue. Dry, clean with xylol, and mount.—Drs. T. K. MONRO and WORKMAN showed a specimen from a case of thrombosis of the mesenteric veins occurring in the course of enteric fever. There was intense venous hyperæmia of the intestine.

20th April 1900.—Dr. RENTON read notes on two cases of removal of the Gasserian ganglion—(*a*) The patient had suffered for seven years from epileptiform neuralgia; spasms of the left side of the face, accompanied by spasms of the left arm and hand, occurred as frequently as thirty times in the hour. In November 1898 the Gasserian ganglion was removed by Hartley and Krause's method. Since then she has had two epileptic attacks, but has remained quite free from neuralgia. (*b*) The patient, a woman, had suffered from epileptiform neuralgia for five years. She had previously had the inferior dental nerve removed, with only a few weeks' relief from pain. The Gasserian ganglion was removed in August 1899. Since then she has remained quite free from pain.—Dr. **Edington** read notes on two cases of removal of gall stones—(*a*) The patient had suffered from intermittent jaundice with colic for six months. The operation took place in November 1897. A vertical incision was made in the right semilunar line, supplemented by a transverse incision. Several calculi were removed from the gall bladder, and another was felt in the hepatic duct. As it was impossible to stitch the gall bladder to the peritoneum, a tube was inserted and packed round with iodoform gauze. After operation, pain over the gall bladder and jaundice persisted. Olive oil was injected, after which the pain and jaundice disappeared. (*b*) The patient, an unmarried woman of 36, had suffered from biliary colic for ten years, the attacks of pain being followed by slight jaundice. The operation took place in January 1899. A vertical incision in the right semilunar line, supplemented by a transverse incision, was made. The transverse colon was bound to the edge of the liver, and the gall bladder projected slightly from underneath the liver, and was buried in adhesions. Several calculi were removed, and the fundus of the bladder was stitched to the parietal peritoneum, and drained. As the symptoms were not relieved, a second operation was performed in July 1899. A mass was found at the junction of the hepatic and cystic ducts. A longitudinal incision was made in the cystic duct, and two large calculi were removed. The incision was stitched, and a drain passed down to it. The patient has remained free from pain since.

Forfarshire Medical Association.—*6th April* 1900.—Dr. C. **Templeman**, Vice-President, in the chair.—Professor **M'Ewan** showed a private of the Royal Highlanders who was suffering from the effects of a Mauser bullet wound received at Magersfontein. The wound entrance was to the right of the seventh cervical vertebra, and the wound of exit was between the tenth and eleventh ribs on the right side. There was some wasting of the scapular muscles, right trapezius, supra- and infraspinatus muscles, some anæsthesia over right shoulder, and also some difficulty in deep breathing, with slight cough.—Professor **Kynoch** showed—(1) Two multilocular ovarian cysts removed by abdominal section; (2) papillomatous ovarian cyst, the size of a child's head, causing retention of urine, and removed by section through the post-vaginal fornix; (3) a uterus with a calcified fibroid in the anterior wall, simulating vesical calculus, and removed by vaginal hysterectomy; (4) adenocarcinoma of the body of the uterus, removed by vaginal hysterectomy.—Dr. J. S. Y. **Rogers** gave the notes of a case of labour complicated by a dermoid cyst. He dealt with the difficulty experienced in this case and the prognosis.—Dr. R. C. **Buist** gave further notes of the case and the treatment adopted. He showed the cyst, and made some remarks on the specimen.—Dr. **Templeman** gave a short summary of the seventy cases of typhus fever he had had under his care in the Fever Hospital during the last two years. Dealing first with the ages, twenty-one were between 5 and 10. There were none between 15 and 20, only one above 60. Of forty-two under 30, only one ended fatally; of twenty-three over 30, eleven were fatal.

OBITUARY.

Sir Douglas Maclagan, M.D., LL.D., F.R.C.P.Ed., F.R.C.S.Ed., F.R.S.E.

Although for some time back evidences of advancing infirmity had made plain to his friends that he was "coming to his grave in a good old age, like a shock of corn cometh in in his season," the news of the death of Sir Douglas Maclagan was received with widespread regret. It was only natural, even in face of the fact that he had attained a tale of years far beyond the span allotted by the Psalmist, that the loss of so interesting a personality, of so attractive a man, should cause deep feelings of sorrow to his friends, and a sense of real loss to all those acquainted with him, his work, and his attainments. For long he filled a striking, almost a unique position in the medical circles of Scotland, and was latterly one of the very few remaining links remaining between the earlier part of the ninteeeth century and its close.

Andrew Douglas Maclagan was the son of a physician, Dr. David Maclagan, who, as one of the medical officers serving under Wellington throughout the Peninsular War, obtained a wide experience of disease and of hardships, which he afterwards applied with such success in the rôle of medical practitioner in Edinburgh, as to successively occupy the presidential chairs of both the Royal Colleges, an exceptional honour only conferred upon his son as well as himself, and to become one of the most esteemed physicians in the city. Sir Douglas was the eldest of his seven sons, of whom three in all embraced the profession of medicine. Born at Ayr on 17th April 1812, and baptized by the same minister who had christened Robert Burns, Douglas Maclagan died in his house in Heriot Row, Edinburgh, on 5th April 1900, within twelve days of completing his 88th year.

He was educated at the High School of Edinburgh, famous as the nursery of many celebrated men, and, proceeding to the Edinburgh University, followed in his father's footsteps by studying medicine and by walking the hospital, as it was then termed. His proficiency in the classical languages in his later years bore testimony to the excellent training afforded him by his school. Nowadays few of the profession can boast a greater acquaintance with the Latin tongue than suffices to supply them with the spurious latinity of a prescription; he, like so many in the past, was a classical scholar, able to write as well as read the dead languages of the South.

When only 19 years of age he took the Licence of the Royal College of Surgeons, and two years afterwards the Fellowship of that College, becoming also M.D. of the University. After spending some time in visiting the medical schools of Paris, Berlin, and London, he returned to Edinburgh, became assistant to his father, and was elected an Assistant-Surgeon in the Edinburgh Royal Infirmary. But surgery was not his proper vocation; materia medica claimed his attention, and for eighteen years he lectured on this subject in the extramural School of Medicine. During this time he devoted much of his time to toxicological inquiries, the direct results of which led to his being appointed by the Crown as successor to Professor Traill in the Chair of Medical Jurisprudence in the University. For thirty-four years he held this post, from 1862 to 1896, and delivered annual courses of lectures,—teaching medical students some law, legal students some medicine,—as well as conducting practical courses in Public Health and medico-legal analyses in his laboratory. For many of these years he acted as the principal adviser to the Crown authorities in Scotland in all such cases as called for expert medico-legal assistance.

Sir Douglas formed one of a band of medical men of the last generation, who both amused and pleased their confrères at social reunions by their more or less poetical but always *à propos* effusions upon topical events. He was associated in this with John Brown and Andrew Wood, J. D. Gillespie, Sidey, and with one who is still, and it may be hoped for long will be spared to us, John Smith. Some of Maclagan's verses ring the true tone of poesy; others, if less artistic, are forcible, and, as in the well-known "Battle of Glen Tilt," served at the time not only to point a moral and to adorn a tale, but to effect the purpose at which they were aimed. As poet-laureate of the New Town Dispensary, as one of the Harveians, and of the Æsculapians, among other clubs, he frequently contributed original songs, many of which were collected and published in book form under the title of "Nugæ Canoræ Medicæ." His scientific tastes led to his becoming a member of several learned societies, among others the Royal Society of Edinburgh, the Botanical and Chemical Societies.

Sir Douglas Maclagan received many tokens of the esteem in which he was held by his contemporaries. He was elected by the Fellows of the Royal College of Surgeons of Edinburgh to the President's chair, an example followed later by the Fellows of the sister College of Physicians, and by the Royal Society of Edinburgh. Glasgow University conferred on him her LL.D. degree, *honoris causâ*, in 1891, Edinburgh following suit in 1897. In 1886 he received the honour of Knighthood in recognition of his services to medicine. For years he was an enthusiastic Volunteer, finally becoming Surgeon-Major to the Edinburgh Brigade; while the Royal Company of Archers, Her Majesty's Bodyguard in Scotland, made him its Surgeon-General. The members of the medical profession presented him with his bust in marble, to mark their appreciation of his elevation to the knighthood; and his colleagues of the New Town Dispensary, about the same time, at one of their annual dinners, asked his acceptance of a laurel wreath in silver.

As a Professor he was lucid, comprehensive, and thorough; by no means striking or brilliant. In the associated office of Professor of Clinical Medicine he was the same,—plain, cautious, rather timid. As an authority upon medico-legal questions he was for many years preeminent; and in the witness-box proved to be an expert without bias. His soberness of manner, and restricted aims in the performance of official duties, contrasted vividly with his bonhomie, his vivacity under social surroundings. A recognised wit, *raconteur*, possessor of true poetic talents, the soul of all unofficial gatherings, he became a conscientious, almost dry, prelector when called on to instruct students. And again, although performance lagged behind desire, he was animated by the true sportsman's ardour, and year after year rented shootings both autumn and winter.

In manner polished, courteous, in speech felicitous, ever generous, strongly attached to old friends, and *per se* to their children, with deep religious views, Sir Douglas Maclagan was no self-seeking, pushing, *fin de siècle* type, but a modest, courtly gentleman, who did what he had to do well, did not aspire to greater things,—was Sir Douglas, and no more,—well beloved by all.

His later years were clouded with domestic sorrow, but he bravely kept on with his work and his interest in life, as long as strength remained to him. He was a warm-hearted friend, and singularly free from guile and suspicion, with a good word for every one, and ever ready to do a kindly act. His frank manner won for him general esteem, and few men had a wider circle of friends. Among them and in the community at large he leaves behind him a fragrant memory.

SIR WILLIAM OVEREND PRIESTLEY, Kt., M.D., M.P.

BY the death of Sir WILLIAM OVEREND PRIESTLEY, which occurred on 11th April, the profession has lost one of its most distinguished members. For some time it had been known that his illness was of a very serious nature, and for some weeks bulletins were so unfavourable that the news of his death, though deeply regretted, created no surprise.

William Overend Priestley was the son of Joseph Priestley of Morley Hall, near Leeds, and the great-grandnephew of the distinguished chemist of the last century—Joseph Priestley. Born in 1829, he received his medical education in Edinburgh, London, and Paris; he took the degree of M.D. Edinburgh in 1853, and was at the same time awarded the gold medal for original research. He attracted the notice of Sir James Y. Simpson, who appointed him his assistant, and for two years after graduation he held this post. He thus at an early period directed his attention to obstetrics and gynæcology, which department he, in later life, so conspicuously adorned. In 1856 he settled in London, and gradually built up a large practice, until in a few years he became one of the leading accoucheurs in the West End. So distinguished was he in this branch of medicine, that he was appointed Physician Accoucheur to H.R.H. the late Princess Alice of Hesse, and to H.R.H. the Princess Christian. He became a Fellow of the Royal College of Physicians of Edinburgh in 1858, and in 1864 he received the Fellowship of the sister college in London.

Sir William Priestley was a popular and successful teacher. On first going to London he became Lecturer at Grosvenor Place School of

Medicine, and later Lecturer on Midwifery at Middlesex Hospital, while in 1862 he was appointed to the important post of Professor of Obstetric Medicine at King's College, and Physician to King's College Hospital. As a teacher he worked with much enthusiasm, and his lectures were characterised as much by their literary merit as by their scientific accuracy.

Many learned Societies claimed him as a member. He was President of the Obstetrical Society of London in 1875–76, and he occupied a similar position at the obstetrical section of the British Medical Association's meeting five years ago, when he delivered a stirring address on over-operating in gynæcology. He felt that in this department of medicine there was a tendency to resort unnecessarily to operative procedure.

He was not a voluminous writer, but his publications always bore the stamp of thoroughness and originality. He was the joint-editor of the collected works of the late Sir James Y. Simpson, and by his individual papers he contributed much to our clinical and scientific knowledge of obstetrics and gynæcology. In recognition of his professional eminence, the honour of Knighthood was conferred upon him in 1893.

There were several interests that closely associated Sir William with Edinburgh. In 1856 he married Miss Chambers, daughter of the late Robert Chambers, LL.D., the well-known author and publisher. In 1884, on the occasion of the tercentenary celebrations, his Alma Mater conferred on him the honorary degree of LL.D. In 1896, in succession to Sir Charles Pearson, who had been elevated to the Bench, he was unanimously adopted as the Unionist candidate to represent the Universities of Edinburgh and St. Andrews in Parliament, and was returned unopposed. In the House of Commons he proved himself a most valuable member, speaking with authority and weight on all questions affecting the medical profession and sanitary science. His intimate knowledge of all these matters was recognised, and he commanded the respect of both sides of the House.

A few years ago Sir William presented £1000 to the University of Edinburgh for the purpose of redecorating the Library Hall—a work which, though urgent, had been long delayed from lack of funds, and this generous gift the University Court gratefully acknowledged.

His last public appearance in Edinburgh was as the guest of the Royal Medical Society at their Annual Dinner last year, when he delivered a most interesting speech.

In private life he was a most fascinating personality, exercising by his courtly manners a peculiar charm over all with whom he came in contact. He was an excellent *raconteur*, with a great fund of anecdote, and an inexhaustible store of humour. A keen sportsman, he was especially devoted to angling, and much of his holiday time was spent at his house in Strathspey. His loss will be mourned, not only by the profession, but by an unusually large circle who enjoyed his friendship and appreciated his sterling worth.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING MARCH 31, 1900; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	39°·4	[1] 69° [2] 133°	182° 531°	2·5	7·5	118	209	3°·00
Observed	37°·0	[1] 27° [2] 51°	208° 608°	2·6	8·8	92	196	2°·12
Difference	−2°·4	[1] −42° [2] −82°	+ 26° + 77°	+0·1	+1·3	−26	−13	−0°·88

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING MARCH, AND SINCE JANUARY 1, 1900. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 1293 [2] 3707	224 214	247 674	42·6 38·8	125 342	27·1 19·8	290 853	50·11 49·0	144 409	25·05 23·5
Actual Deaths and Rate per 10,000	[1] 1223 [2] 4055	211·9 23·4	229 674	39·6 38·8	115 396	20·0 22·9	256 991	44·31 57·1	141 429	24·55 24·6
Difference from Mean	[1] − 70 [2] + 348	−12·1 +20·0	−18 ± 0	−3·0 ± 0	−10 +54	−1·7 +3·1	− 34 +138	−5·8 +8·1	− 3 +20	−0·5 +1·1

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 71 [2] 213	12·34 12·34	32 88	5·5 5·1	105 297	18·3 17·1	132 349	22·8 20·2	51 151	8·8 8·66
Actual Deaths and Rate per 10,000	[1] 87 [2] 255	15·05 12·74	34 108	5·8 6·2	111 398	19·3 22·9	117 322	20·2 18·6	56 161	9·6 9·26
Difference from Mean	[1] +16 [2] +42	+2·71 +2·4	+ 2 +20	+0·3 +1·1	+6 +101	+1·0 +5·8	−15 −27	−2·6 −1·6	+5 +10	+0·8 +0·6

* NOTE.—The figures [1] denotes the data for March, [2] for year to date.

From the meteorological data obtained from the East of Scotland records for the month of March, or rather for the five weeks ending on the 31st, the mean temperature of the district shows as much as 2°·4 F. below the average, following upon the still more pronounced decrease below the normal (equal to 5°·75 F.) experienced in February. During these two periods the causes of the low mean temperatures present a strong contrast; in February the accumulated day-degrees below 42° were in great excess, those above 42° entirely absent; in March the deficiency in day-degrees above 42° was greater in actual amount than during the preceding month, the excess of those below that figure only about one-tenth of, in place of being nearly equal to, the average sum. The rainfall for the east of Scotland slightly exceeded the mean, in striking contrast to that recorded in the west of Scotland; the total fall in Greenock, for instance, falling short of the expected amount by 94 per cent. The hours of bright sunshine were much fewer than usual, while the mean daily variability of temperature was very small.

For the first three months of the year the accumulated figures show a marked deficiency of warmth, diminished sunshine, and a considerable increase in cold weather; the deficit in day-degrees above 42° F. amounting to 61 per cent., the excess below 42° F. to 14 per cent., of the usual totals.

The total number of deaths registered during March in the four large towns dealt with was 5·4 per cent. below the average; the mortality from constitutional, circulatory, respiratory, and nervous diseases, as also from phthisis, being less than expected. Digestive and urinary causes, pneumonia, and cancer show increased rates. Influenza caused forty-three deaths. For the year to date the rate of mortality in these towns has been higher than usual, especially from pneumonia, urinary, digestive, circulatory, and respiratory diseases; lower from phthisis, and equal to the average from constitutional ailments.

Thus March with a marked want of warmth, decreased sunshine, a normal rainfall, and a low mean daily variability of temperature, shows a lower rate of mortality than that looked for; the year to date, with a great lack of warmth, a considerable excess of cold weather, an increased rainfall, and deficient sunshine, yields a death-rate over the normal, especially from urinary, digestive, circulatory, and respiratory causes. Quite apart from the meteorological factors, it is of interest to note that the mortality rates for the three months bear a direct relationship to the number of deaths recorded as due to influenza. In these months, 85, 139, and 43 deaths were severally ascribed directly to influenza; the difference in the number of the total deaths from the normal being respectively +140, +278, and −70, and of those from pneumonia, +44, +51, and +6; notwithstanding the fact that January was a warm month, though wet, while February was abnormally cold, with no warmth over 42° F. throughout, and the mean temperature of March was also low, but not so pronouncedly.

EDINBURGH MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

HAS ANTITOXINE REDUCED THE DEATH RATE FROM DIPHTHERIA IN OUR LARGE TOWNS?[1]

By Louis Cobbett, M.D. (Cantab), F.R.C.S.

Diphtheria antitoxine has been in general use for five years, and those best in a position to judge of its action are, almost without exception, firmly convinced that it is a real and very valuable specific remedy. Nevertheless, there are in this country a large number of medical practitioners who, either because they are not yet convinced of its worth, or because their interest in the recent advance of medical science has not been aroused, do not employ it, and it is to be feared that many lives are consequently lost. For this reason the study of the therapeutic value of antitoxine cannot as yet be said to be superfluous.

Much of the evidence upon which the case for antitoxine has hitherto rested consists of hospital statistics of the case mortality of diphtheria. It has been urged that much of this evidence is seriously impaired by the modern practice, which has grown up concurrently with the use of antitoxine, of basing the diagnosis of diphtheria on the presence of certain bacilli in the mouths of those suspected of having the disease. Rightly or wrongly, this practice is credited with having caused many mild cases of sore throat to be classed as diphtheria, and with having in this way lessened the apparent case mortality of this disease.

Again, the returns of the Metropolitan Asylums Board Hospitals are influenced by the largely increased accommodation now afforded to patients suffering from diphtheria. In pre-antitoxine years these hospitals received less than one in every four cases notified in London. In recent years the accommodation for these patients is sufficient for nearly half the cases notified.[2] It is clear that this change must have influenced the average severity of the cases admitted, and that to this cause must be ascribed part of the decline in case mortality which has taken place there in recent years.[1]

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[1] From the Pathological Laboratory, Cambridge.

[2] In 1890 the ratio of M.A.B. hospital admissions for diphtheria to notifications of that disease in London was 1-6·8; in 1894, 1-4·1; in 1897, 1-2·3.

On the other hand, the Metropolitan Asylums Board Reports contain most trustworthy evidence of the value of antitoxine, against which the arguments just mentioned cannot be brought. I refer more particularly to the recovery rate of laryngeal cases, which in 1898 was almost double as high as it was in 1894, and to that of the tracheotomies, which more than doubled in the same period. No new principle of diagnosis, nor any amount of increased accommodation, could have produced these results. I do not intend to refer to these statistics any further, having already dealt with them in another paper. Other means of testing the value of diphtheria antitoxine exist, and are the proper subject of the present communication.

The mortality returns of our great towns have not been called upon to any great extent to give their evidence as to the value of diphtheria antitoxine. Perhaps it may be thought that scarcely sufficient time has yet expired. Diphtheria, though never absent from our great towns, varies greatly in prevalence from year to year, and at times increases to the proportions of a veritable epidemic. Such variations exert a very disturbing influence upon the death rate from the disease, and we can only judge of the influence of a new remedy after a good many years of trial. At the present time the returns of five years are available, during which it has been possible to use diphtheria antitoxine, and if the serum is the mighty remedy which its advocates proclaim it to be, I think its critics may justly claim that by now it should have left some unmistakable mark upon the diphtheria death rate, wherever it has been extensively used.

The disturbing effect of epidemic visitations upon the diphtheria death rate is less marked in the larger than in the smaller towns. I therefore selected ten of the largest and most representative towns in Great Britain and Ireland, and applied to their medical officers of health for the necessary information. I was unfortunately unable to obtain the figures for Dublin, and those of Belfast proved too incomplete for my purpose. These towns had therefore to be left out, and the investigation confined to Great Britain. London was added afterwards, and Paris and Berlin for the sake of comparison.

The towns were selected merely on acccount of their size and importance, and I had no previous knowledge of the diphtheria statistics of any but the three last mentioned.

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[1] The death rate per 100 cases admitted was 29·6 in 1894, 15·1 in 1898 (M.A.B. Reports). The mean rate for eight years ending with 1895 was 30·3, while that for the five which followed was 18·4,—a decline of 39 per cent. (Goodall, *Brit. Med. Journ.*, London 1899, vol. i. p. 197).

The returns of the number of deaths attributed to diphtheria, etc., in London have been furnished by the Registrar-General, the number of notifications in that city by the Medical Officer of Health. The figures for Paris have been sent me by M. Bertillon, Chef des travaux statistiques de Paris, and those of Berlin by the President of the Imperial Health Office.

I should like to take this opportunity of thanking these gentlemen and the medical officers of health of the other towns here mentioned, for the very kind consideration they have given to all my enquiries.

From the information collected I have calculated the annual death rate from diphtheria and membranous croup—that is, the ratio of deaths from this cause to inhabitants, and the annual case mortality—or the ratio of deaths to cases reported. I have also added the annual notification rate.

In order to study the influence, if any, of antitoxine upon these rates, I have divided the years into two periods, namely, that ending with 1894—at the end of which year the antitoxine treatment may be said to have been introduced—and that which has succeeded the beginning of 1895, up to the end of 1899. For these two periods the *mean* annual death, notification, and case mortality rates have been calculated. These facts have been collected into a series of tables, and have been further illustrated by diagrams. The numbers given in the tables represent the death and notification rates per 100,000 persons living at the time, and the case mortality per 100 notifications. With certain exceptions, mentioned hereafter, the tables and diagrams are comparable with one another.

Before proceeding to examine the tables and diagrams, several points need to be considered:—

1. The annual death rate from any disease in a given town will vary according to—(*a*) The prevalence of that disease; (*b*) the severity of its type; (*c*) the success with which it is treated.

(*a*) The notification rate will show pretty accurately the prevalence of the disease from time to time. There may, however, owing to the gradual adoption of the bacterial test as a means of diagnosis, possibly be an increasing tendency to attribute to diphtheria mild cases which were not formerly recognised as such. If this be so, it will account for a slight progressive rise in the notification rate. Sudden changes must be due to other causes.

(*b* and *c*) Changes in the severity in the type of the disease, and in the success with which it is treated, will both influence the case mortality. Decline of the case mortality due to better treatment will synchronise with the adoption of that treatment, and will progress steadily with its gradual improvement and extending use, while that due to changes in the type of the disease may be expected to be of an irregular kind. In interpreting the changes which have taken place in case mortality, we must perhaps again make some allowance for an increasing tendency to notify mild cases, which, if it has existed, will have caused a progressive diminution of the rate.

2. In estimating the death rate from diphtheria, it is very important to collect together all the deaths really caused by that disease. It is generally admitted that many deaths from diphtheria have been and are still ascribed to "croup." No one now doubts that those attributed to "*membranous croup*" should be included with diphtheria, and this has been done by the Registrar-General since 1889. But besides those ascribed to "membranous croup," there are a considerable, but rapidly decreasing, number of deaths attributed to "croup" not so qualified.[1]

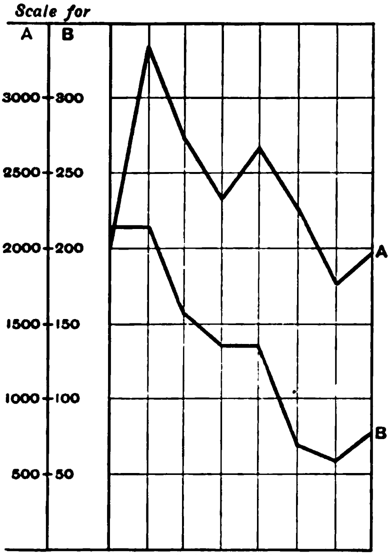

FIG. 1.—Showing the number of deaths annually attributed in London to (*A*) "diphtheria" and "membranous croup" on the one hand, and to (*B*) "croup" (not qualified as membranous) on the other.

Most of these deaths are, I believe, caused by diphtheria; and, in support of this opinion, I have drawn up the following chart, which shows that the deaths annually attributed to this cause, while on the whole rapidly diminishing in number, nevertheless fluctuate in accordance with the fluctuations of the numbers of the deaths ascribed to diphtheria.

If it were not that the number of deaths attributed each year to "croup" are rapidly diminishing, in consequence of a growing tendency to ascribe them to "diphtheria" or "membranous croup," it would not much matter for our present purpose whether they were included or not. But in consequence of this tendency, their exclusion affects the earlier years which are under consideration to a far greater extent than the more recent years. Hence, in the case of London, for example, if we include with diphtheria all kinds of croup, the mean annual death rate of the last five (antitoxine) years is 8 per cent. lower than that of the six preceding (pre-antitoxtine) years; while, if we exclude those deaths attributed to "croup," *not qualified as membranous*, it is actually 1·4 per cent. higher.

The case mortality also is influenced in a similar way, to the detriment of recent years, by the exclusion of these deaths attributed to "croup," because the cases diagnosed as such form a class which is far more fatal than the average case of diphtheria.

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[1] In London, 458 in 1889, but only seventy-seven in 1899. In Glasgow, fifty-four in 1892, nineteen in 1898.

While I am of opinion that we should get more accurate statistics of diphtheria if we were to include all deaths attributed to croup, I have nevertheless been unable to do so in most cases, because the returns for "croup," particularly the notifications, were not generally available. I have therefore been obliged to content myself by including with diphtheria membranous croup only. But in the tables for London and Glasgow I have added an extra column giving the death rate from diphtheria and croup of all kinds.

In Newcastle the deaths attributed to croup are not subdivided. I have therefore been obliged to give the death rate of diphtheria and croup of all kinds only. And since in that town notification of croup was not commenced until this year, the case mortality is that of diphtheria only. With these exceptions, all the tables and diagrams for British towns relate to diphtheria and membranous croup.

From what has been said, it will be seen that I have not found it possible to make my tables quite uniform, and a further disparity exists in the number of years to which they each go back. In Leeds there were no notifications before 1895, and in Birmingham the number of deaths from membranous croup before 1891 could not be ascertained, therefore the tables for these towns are short. But, rather than reduce all to the size of the smallest, I have preferred to let the inequality remain, and each speak according to its ability for its own town.

THE DIAGRAMS.

In these diagrams the dark columns represent the annual death rate, and the line the annual notification rate. For convenience sake the notification rate is represented on a scale which is only one-quarter that of the death rate. Consequently, where the notification line coincides with the top of a column, there were four times as many deaths as notifications, *e.g.* the case mortality was 25 per cent. When the notification line is above the top of the column, the case mortality is less; and when below the top of the column, greater than 25 per cent.

All the diagrams are drawn on the same scale. They refer to diphtheria and membranous croup in the case of all British towns except Leeds and Newcastle. The diagrams for Leeds, Newcastle, and also that for Paris, refer to diphtheria and croup of all kinds, while that for Berlin refers to diphtheria only.

Taking now the several towns in order, we find in London the death rate from diphtheria and croup *of all kinds* fairly constant between 1889 and 1892, fluctuating between forty-two and fifty-one per 100,000 inhabitants.

LONDON.

(Population, 1899, 4,546,752.)

TABLE I.

Year.	Diphtheria and all Kinds of Croup.		Diphtheria and Membranous Croup.					
	Death Rate per 100,000 Inhabitants.		Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Death Rate per 100 Notifications.	
1889 . .	50·1	56·0	39·1	48·6				
1890 . .	45·1		33·1		153·6	216·0	21·5	23·4
1891 . .	42·0		34·0		151·9		22·4	
1892 . .	51·2		46·1		195·8		21·2	
1893 . .	80·9		76·1		318·0		23·9	
1894 . .	65·8		62·4		257·3		24·2	
1895 . .	56·4	51·4	53·5	49·3	255·5	286·2	20·9	17·2
1896 . .	63·3		59·9		313.0		19·2	
1897 . .	52·4		50·9		295·6		17·2	
1898 . .	40·5		39·2		263·2		14·9	
1899 . .	44·9		43·3		302·7		14·3	

In 1893 the rate almost doubled, and rose to 81. Since that time it has steadily declined, showing no abrupt change on the introduction of antitoxine. A minimum rate of 40·5 was reached in 1898.

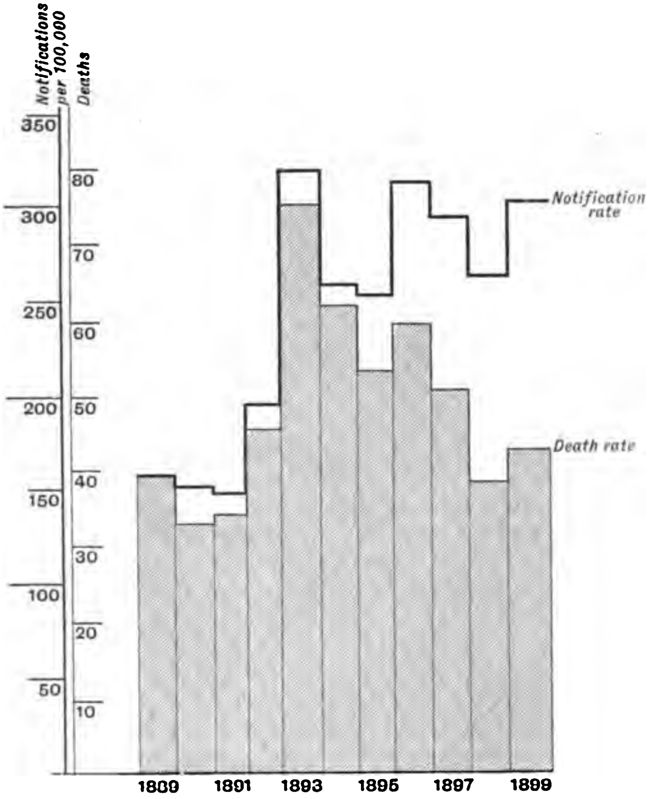
The mean of five antitoxine years was 8 per cent. lower than that of the six preceding years.

If we exclude the deaths ascribed to croup, *not qualified as membranous*, the improvement in recent years is less apparent, and the mean of the five antitoxine years comes out 1·4 per cent. *higher* than that of the six preceding years. This method of reckoning, as I have already explained, does not do justice to the true state of the case, and I think it cannot be doubted that the mortality from diphtheria in London has been less since the introduction of antitoxine than it was in the preceding six years.

This is the more remarkable because the disease has been far more prevalent in recent years. In 1893 the notification rate rose 60 per cent., and it has since remained near the height then attained; so that the mean annual notification rate for the five antitoxine years is 32 per cent. higher than that of the five preceding years.

Turning now to the diagram for London, we see that from the first year of the adoption of the Notification Act in 1891, until the end of 1894, the notification rate and the death rate followed one another very closely. In other words, the case mortality was fairly constant.

In 1895, however, a change occurs; and the lines indicating the two rates in the diagram begin to separate, and from that time onwards the gap continues to increase until the end of the record. This separation is mainly due to the fall in the death rate. For from 1895 onwards diphtheria remained quite as prevalent as before.



The fall in the case mortality began abruptly in 1895, and amounted in that year to nearly 14 per cent. of the rate for 1894. Since that time it has steadily progressed, the rate for each successive year being the smallest till then recorded in London, until in 1899 it reached the low level of 14·3 per cent.

The mean annual case mortality for the five antitoxine years was 17·2. That for the five preceding years was 24·4, a decline of 26 per cent., which is very satisfactory.

EDINBURGH.

(Population, 1899, 298,000.)

TABLE II.

Year.	DIPHTHERIA AND MEMBRANOUS CROUP.					
	Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Death Rate per 100 Notifications.	
1880	15·1		76·4		19·7	
1881	20·1		74·8		26·9	
1882	14·1		93·3		15·2	
1883	14·4		90·7		15·8	
1884	18·4		76·5		24·0	
1885	17·7		61·4		28·8	
1886	20·7		86·3		24·0	
1887	22·9	22·2	102·8	95·6	22·2	23·2
1888	25·7		101·1		21·5	
1889	38·3		138·9		27·6	
1890	32·8		139·5		23·5	
1891	18·3		78·9		23·1	
1892	15·8		76·6		20·6	
1893	23·1		93·7		24·7	
1894	31·7		133·7		23·7	
1895	23·7		114·7		20·7	
1896	18·8		90·7		20·7	
1897 (*a*)	15·4	15·8	73·1	92·4	20·5	16·3
1898	12·8		90·9		14·1	
1899	9·6		93·9		10·0	

(*a*) City extended by inclusion of Portobello, etc.

In Edinburgh we find a death rate from diphtheria and membranous croup which is low, but somewhat variable. In the pre-antitoxine years it rose from a minimum of 14·1 in 1882 to a maximum of 38·3 in 1889. After falling to 15·8 in 1892, it again rose to 31·7 in 1894. Since that time the rate has progressively diminished, and in the last two years it has been considerably below all previous records for that city, namely, 12·8 and 9·6 per 100,000 respectively.[1]

Turning to the diagram, we see that as in London the death rate columns fall away from the notification curve, but here the change does not begin till 1898.

The case mortality did indeed fall from 23·7 in 1894 to 20·7 in 1895, but this was not lower than it had been in 1892. For three years it continued about the same, but in 1898 it fell to 14·1—a decline of 26 per cent., and in 1899 it stood at 10 per cent., which, with the exception of 8·1 in Paris in 1899, is the lowest case mortality recorded in these tables.

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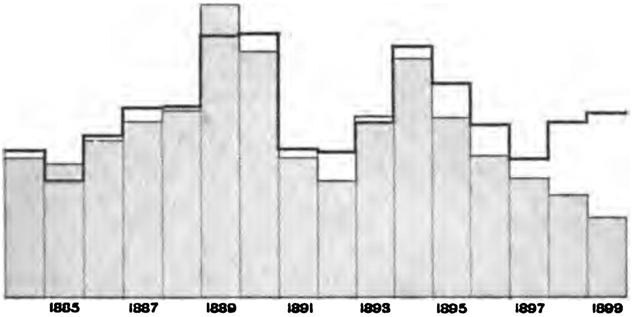
[1] The rate 9·6 in 1899 shares with the rate 6·8 in 1889, and 7·2 in 1890 and 1891 in Bristol, and with the rate 8·6 and 9·4 in Manchester in 1887 and 1888 respectively, and 9·4 in Paris in 1899, the credit of being the lowest recorded in these tables.

The mean annual case mortality rate for the fifteen pre-antitoxine years was 23·2 per cent., that for the five succeeding years 16·3. Thus there has been a decline of about 30 per cent. of the former rate, which is equivalent to a saving of nearly one-third of the lives which would have been lost under the older conditions.



GLASGOW.

(Population, 1899, 733,900.)

TABLE III.

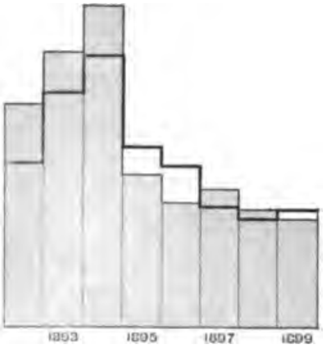
Year.	Diphtheria and Croup of all Kinds.	Diphtheria and Membranous Croup.		
	Death Rate per 100,000 Inhabitants.	Death Rate per 100,000 Inhabitants.	Notification Rate per 100,000 Inhabitants.	Death Rate per 100 Notifications.
1886	39·1			
1887	53·6			
1888	50·0			
1889	54·0			
1890	36·3 } 43·8		102·6	
1891	34·4		81·1	
1892	37·2	29·1	85·6 } 107·6	34·0
1893	45·8	36·3 } 35·9	121·8 } 116·3	29·8 } 30·9
1894	45·1	42·2	140·8	30·0
1895	26·6	19·7	94·3	20·9
1896	19·4	16·4	85·5	19·2
1897	20·3 } 20·2	17·7 } 16·8	64·7 } 73·3	27·5 } 23·0
1898	18·2	15·6	59·0	26·1
1899	16·8	14·8	62·3	23·4

In Glasgow, the second city of Great Britain, with a population of nearly three-quarters of a million, we find that the annual death rate from diphtheria and croup of all kinds was rising from 1886 onwards, until in 1889 it reached a maximum of 54 per 100,000. In the next year it fell to 36·3, after which it rose again year by year until a rate of 45·1 was reached in 1894.

In 1895 it fell suddenly and considerably to 26·6; the diminution thus resulting being over 45 per cent. of the rate for 1894. This decline, which occurred on the general introduction of antitoxine, may be compared with the decline which occurred in the pre-antitoxine year 1890; the latter amounted to 33 per cent. Since 1895 the diminution of the death rate has continued; a minimum of 16·8 per 100,000 having occurred in 1899.

The mean annual death rate for nine pre-antitoxine years was 43·8, that of the five antitoxine years 20·2. The decline which has taken place amounts to over 50 per cent. of the former rate.

If we exclude those deaths ascribed to croup not qualified as membranous, we have only three pre-antitoxine years for comparison. Comparing the mean annual death rate from diphtheria and membranous croup of these three years with that of the succeeding five, we find again a decline of over 50 per cent.



The decline in the death rate since 1894 is due partly to a diminution in the prevalence of the disease, and partly to a fall in the case mortality. Thus, comparing the five antitoxine years with the three pre-antitoxine years, we find a fall in the mean annual death rate of 53 per cent., a fall in the mean annual notification rate of 37per cent., and a fall in the mean annual case mortality rate of 25·6 per cent. Therefore we must conclude that the decline in the death rate from diphtheria is to be ascribed partly to decline in the amount of disease, and partly—to a somewhat less extent—to improvement in the case mortality.

In Glasgow the improvement in case mortality commenced abruptly in 1895, as it did in London, but here the improvement has not continued to progress uniformly, a rise having taken place in 1897.

In Liverpool the diphtheria death rate, which stood at the low mean rate of 14·8 during eight pre-antitoxine years, has been increasing since 1894, until it has reached a maximum of 32·6 in 1899. The smallest rate during the last thirteen years occurred in 1889. The mean annual rate for eight pre-antitoxine years was 14·8, and that of the succeeding five 24·1.

Since the introduction of the Notification Act in 1891, the notification rate has varied concurrently with the death rate,[1] and no change in the relative position of the two curves took place at or after the general introduction of antitoxine. In this respect Liverpool presents a striking contrast to nearly all the other towns here considered.

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[1] 1895 is an apparent exception. In that year the city boundaries were extended, and since in part of the new area the Notification Act had not previously been in force, it is very possible that less than the usual proportion of cases was notified in that year. This would account, partly at least, for the very high apparent case mortality in that year.

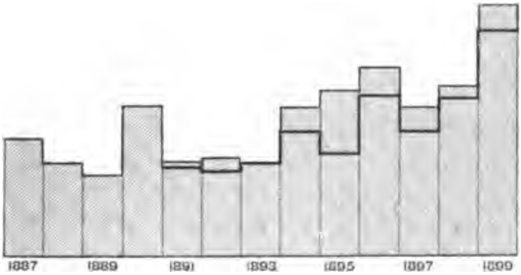
LIVERPOOL.

(Population, 1899, 668,645.)

TABLE IV.

Year.	Diphtheria and Membranous Croup.					
	Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Death Rate per 100 Notifications.	
1887 . .	16·0	14·8				
1888 . .	12·5					
1889 . .	10·9					
1890 . .	20·0					
1891 . .	12·2		45·8	51·3	26·5	27·7
1892 . .	13·0		44·2		30·0	
1893 . .	12·3		49·0		25·2	
1894 . .	19·1		66·4		28·7	
1895 . .	21·8	24·1	53·3	81·0	[1] 40·9	29·7
1896 . .	24·5		83·1		29·5	
1897 . .	19·4		66·7		29·3	
1898 . .	22·1		82·8		26·7	
1899 . .	32·6		118·7		27·5	

As is implied in what has just been said, the case mortality has altered little during the period under consideration. But that little change which has occurred has been in the wrong direction, and the mean of the last five years has been 7 per cent. higher than that of the preceding four.



In Manchester the death rate from diphtheria and membranous croup rose rapidly from 15 in 1886 to 51 in 1889. After that it fell a little to about 25 in 1891 and 1892, to rise again in 1893 to 35. Since that year it has steadily diminished, until in 1897 it reached a minimum of 8·6, the lowest rate recorded in any of the towns here considered. Since 1898 it has slightly risen again.

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[1] This high rate is explained by the fact that in 1895 the city boundaries were extended, 134,000 being added to the population. In part of this new district the Notification Act had not been adopted prior to that year. It is probable, therefore, that in this year a larger proportion of cases of diphtheria escaped notification than was the case in subsequent or preceding years.

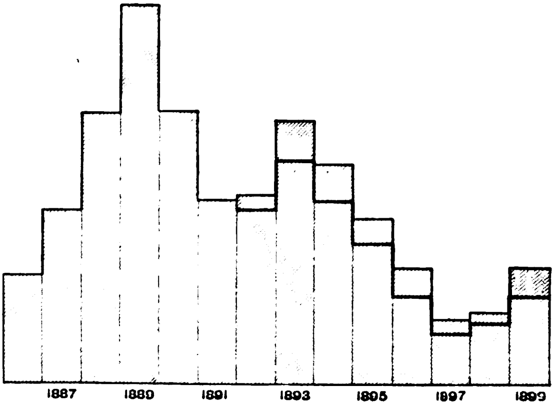
MANCHESTER.

(Population, 1899, 550,864.)

TABLE V.

Year.	Diphtheria and Membranous Croup.		
	Death Rate per 100,000 Inhabitants.	Notification Rate per 100,000 Inhabitants.	Deaths per 100 Notifications.
1886 . .	15·0		
1887 . .	23·0		
1888 . .	36·0		
1889 . .	51·0		
1890 . .	36·0 } 30·7		
1891 . .	25·0		
1892 . .	25·3	96·6	26·2
1893 . .	35·1	120·3 } 105·1	29·2 } 28·2
1894 . .	29·0	98·4	28·9
1895 . .	21·4	74·6	28·7
1896 . .	15·6	47·2	33·0
1897 . .	8·6 } 14·1	27·6 } 45·9	31·0 } 30·7
1898 . .	9·4	35·5	26·5
1899 . .	15·4	45·2	34·1

The mean annual death rate of five antitoxine years is 14·1, that of the nine preceding years 30·7, an improvement of 54 per cent. Since notification was begun in 1892, the notification rate has varied concurrently with the death rate, the fluctuations in the case mortality being small. The five antitoxine years give a



mean annual case mortality of 30·7, the three preceding years one of 28·2. Therefore, while the death rate from the cause in question has materially diminished in Manchester in recent years, it underwent no abrupt drop on the introduction of antitoxine. And the diminution in the number of deaths was due entirely to the disease being less prevalent, and was accompanied by no fall in the case mortality.

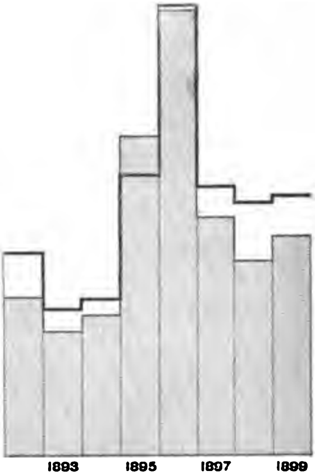
BIRMINGHAM.

(Population, 1899, 514,956.)

TABLE VI.

Year.	Diphtheria and Membranous Croup.					
	Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Number of Deaths per 100 Notifications.	
1892 . .	21·0	18·8	110·1	90·6	19·1	20·8
1893 . .	16·9		79·2		21·4	
1894 . .	18·4		82·8		22·4	
1895 . .	43·0	37·4	149·1	160·0	28·9	23·4
1896 . .	59·0		238·1		24·5	
1897 . .	31·6		140·8		22·4	
1898 . .	25·8		133·0		19·1	
1899 . .	28·5		135·8		20·4	

The table for Birmingham does not go back beyond 1892, because there is no record of the deaths ascribed to membranous croup beyond that year.



In 1895–96 there was an epidemic increase of diphtheria, the number of deaths ascribed to this cause and to membranous croup in those two years being almost twice as many as in the preceding three. In 1897 the death rate fell nearly 50 per cent., and it has since remained about the same level.

During the epidemic of 1895–96 the notifications do not quite keep pace with the deaths. The case mortality for these years is consequently high, a maximum of 28·9 per cent. having been reached in 1895. Since that time it has steadily improved, and, if we exclude the two epidemic years, we find that the mean case mortality rate for the last three antitoxine years is about the same as that of the three pre-antitoxine years.

The rise in the mean annual death rate from diphtheria and membranous croup for the last five years, when compared with that of the preceding three, is largely due to the epidemic of 1895–96. But even if we exclude these years, the mean death rate for the last three is higher than that of the three pre-antitoxine years. The records of this town, like those of Liverpool and Manchester, show no sign of having been influenced by antitoxine.

LEEDS.

(Population, 1889, 423,889.)

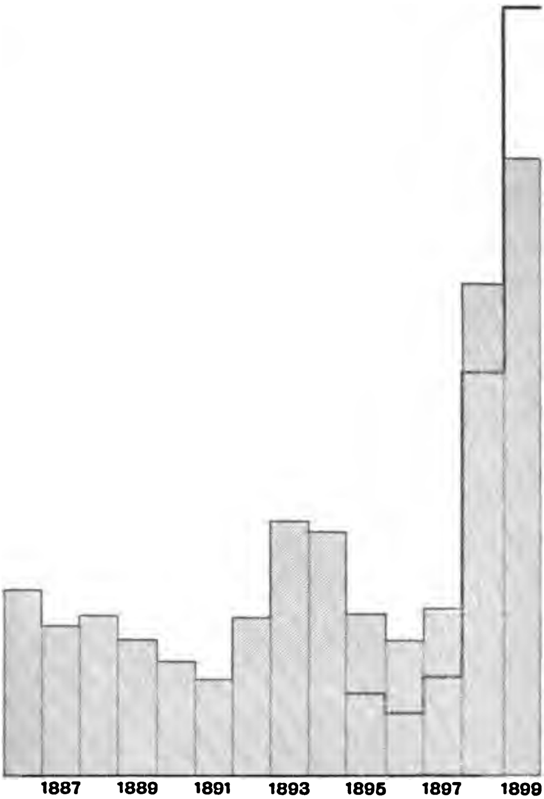
TABLE VII.

Year.	DIPHTHERIA AND CROUP.		DIPHTHERIA AND MEMBRANOUS CROUP.					
	Death Rate per 100,000 Inhabitants.		Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Death Rate per 100 Notifications.	
1886	24·8	22·3						
1887	19·7							
1888	21·1							
1889	17·9							
1890	15·7							
1891	12·7							
1892	20·8							
1893	33·8							
1894	32·7							
1895	21·5	41·5	17·4	37·0	43·2	156·6	40·5	23·6
1896	18·4		12·2		33·8		36·6	
1897	22·2		15·6		51·3		35·2	
1898	65·3		55·0		213·9		25·7	
1899	82·3		79·0		424·4		18·6	

For Leeds we have no notifications and no differentiation of croup into membranous and non-membranous before 1894. So the pre-antitoxine case mortality is not known.

Leeds has been suffering from a severe epidemic of diphtheria during the last two years; the number of deaths annually attributed to this cause having risen from 22·2 per 100,000 in 1897 to 65 in 1898, and to 82 in the following year. There had previously been a small epidemic in 1893–94, after which the death rate had fallen to near the usual level. This fall occurred in 1895, the year in which antitoxine was generally introduced.

Since notification was only begun in Leeds in 1894, it is impossible to find out whether the mean annual case mortality has declined since the introduction of antitoxine or not. But since 1895, when there were no less than forty deaths to every 100 notifications, the annual case mortality has gradually fallen to 18·6 in 1899. The rate at which this decline has taken place during the last four years was 9·6, 3·8, 27·0, and 27·7 per cent. respectively. Thus by far the greatest part of the fall has occurred during the epidemic years, 1898–1899, a fact which may possibly have been caused by an increased amount of attention being given to new methods of treatment, or perhaps, to some extent, by the epidemic having given a stimulation to notification.



In Bristol the number of deaths attributed to diphtheria and membranous croup during the past thirteen years have been relatively small. In 1889, 1890, and 1891 there were only about 7·0 deaths per 100,000. During the next three years a relatively large increase took place, a maximum of 23·5 being reached in 1893. In 1895 the rate fell to 14·9 (a fall of 34 per cent.), and it has since continued low, the lowest rate since 1891, namely 10·2, being reached in 1899.

The rise in the death rate in 1892 was accompanied by a great increase in the case mortality, which became worse and worse until a maximum of thirty-nine was reached in 1894. A marked and sudden change then took place. The fall in the death rate (34 per cent.) during the next year occurred in spite of a considerable rise (30 per cent.) in the notification rate, and was entirely due to a decline in the case mortality. The latter fell in that year from 39 to 20·6 per cent., that is to say, by almost one-half. In the next year it again fell, this time by one-third.

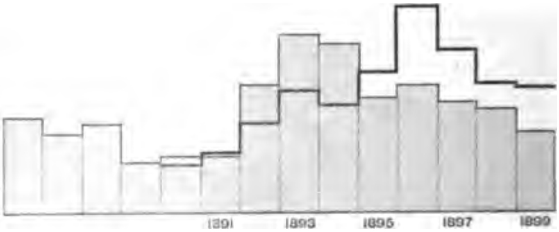
BRISTOL.

(Population, 1899, 329,911.)

TABLE VIII.

Year.	Diphtheria and Membranous Croup.		
	Death Rate per 100,000 Inhabitants.	Notification Rate per 100,000 Inhabitants.	Death Rate per 100 Notifications.
1886 . .	13·7		
1887 . .	10·6		
1888 . .	11·9		
1889 . .	6·8		
1890 . .	7·2 } 13·3	25·4	28·5
1891 . .	7·2	31·5	22·8
1892 . .	16·9	47·4 } 44·8	35·8 } 34·5
1893 . .	23·5	62·6	37·5
1894 . .	22·6	56·4	39·0
1895 . .	14·9	72·3	20·6
1896 . .	16·4	111·8	14·7
1897 . .	15·5 } 13·9	88·2 } 80·7	17·5 } 17·4
1898 . .	13·8	69·4	20·0
1899 . .	10·2	67·3	15·2

The mean annual case mortality for the five pre-antitoxine years was 34·5, that of the five antitoxine years was 17·4. Thus, comparing the one period with the other, there has been an improvement of no less than 50 per cent.



In Newcastle the death rate from diphtheria and croup (of all kinds) was formerly rather high, but declined about one-third in the two years which immediately preceded the general introduction of antitoxine. In 1895 the rate rose to its former mean level, but since that year it has steadily fallen again, until in 1899 it was 18 per cent. less than the pre-antitoxine minimum, and 47 per cent. less than the pre-antitoxine mean.

NEWCASTLE-ON-TYNE.

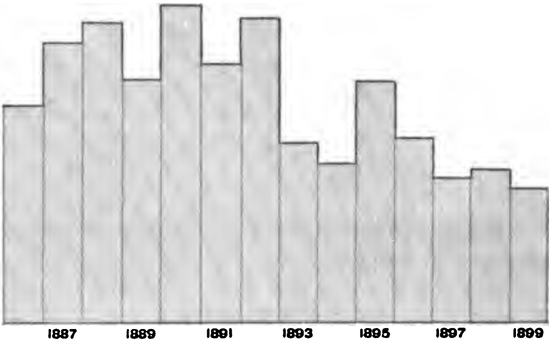
(Population, 1899, 228,625.)

TABLE IX.

Year.	Death Rate from Diphtheria and Croup per 100,000 Inhabitants.		Notifications of Diphtheria only[1] per 100,000 Inhabitants.		Number of Deaths per 100 Notifications. Diphtheria only.[1]	
1886	29·6	33·3	47·5	69·7	26·0	26·9
1887	37·6		57·3		34·4	
1888	40·2		61·0		34·0	
1889	32·3		59·6		31·25	
1890	42·3		111·5		24·3	
1891	34·7		64·5		34·7	
1892	40·6		81·1		26·3	
1893	24·4		86·7		16·4	
1894	21·3		55·4		24·1	
1895	32·4	23·2	84·4	58·4	28·2	24·2
1896	24·9		77·2		20·7	
1897	19·3		46·8		17·6	
1898	20·2		39·9		30·3	
1899	17·6		46·8		24·3	

The mean of the nine pre-antitoxine years was 33·3, that of the five antitoxine years 23·2. Thus, comparing the one period with the other, there has been a fall of 30 per cent.

In estimating the annual case mortality from diphtheria in this town, we have to rely upon the numbers of cases notified as, and deaths attributed to, "diphtheria" only, there being no notification of croup or membranous croup available. The case mortality estimated in this way shows a small decline, the mean of nine pre - antitoxine years being 26·9, and that of five antitoxine years 24·2—a fall of 10 per cent. As



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[1] Membranous croup was not required to be notified before 1900.

already explained, this method of estimating the case mortality which excludes croup, favours the earlier years of the period under consideration more than the later ones; the real decline is therefore probably greater than this. We may therefore safely attribute at least one-third of the (30 per cent.) fall in the mean annual death rate which has taken place since the end of 1894 to an improvement in the proportion of recoveries.

PARIS AND BERLIN.

(Population, 1899, (1) 2,547,000 ; (2) 1,760,662.)

The consideration of the records of Paris and Berlin have been deferred until now, because they are included only for the sake of comparison.

In these cities antitoxine was far more readily welcomed than in this country, and the fall in the annual diphtheria death rate, which there took place on its introduction, far exceeded in magnitude and in the abruptness of its commencement any other which is considered in this paper.

TABLE X. (PARIS).

Year.	Diphtheria and Croup.					
	Death Rate per 100,000.		Notification Rate per 100,000.		Deaths per 100 Notifications.	
1886 . .	65·2	62·2				
1887 . .	70·1					
1888 . .	75·4					
1889 . .	73·3					
1890 . .	70·3					
1891 . .	56·9					
1892 . .	57·9					
1893 . .	51·8					
1894 . .	41·0					
1895 . .	17·6	13·3	174·7	130·1	10·1	10·2
1896 . .	17·8		149·9		11·9	
1897 . .	11·9		110·2		10·8	
1898 . .	10·2		100·8		10·15	
1899 . .	9·4		116·1		8·1	

In Paris the use of antitoxine had already made considerable progress in 1894, and the diphtheria death rate was already lower in that year than in any previous one under consideration. Nevertheless, in 1895, it was less than half as great as in 1894. It has steadily continued to fall since, each annual rate being a record, until in 1899 the rate was less than one-sixth of the mean for the nine pre-antitoxine years.

The mean annual diphtheria death rate in Paris during nine pre-antitoxine years was 62·2, that of five antitoxine years 13·3, a decline of 80 per cent.

We do not know the number of notifications in Paris before 1895, and so we have no means of estimating the case mortality in the pre-antitoxine period, but there can be scarcely any doubt that it greatly improved in 1895, for in that year it already stood at the low level of 10·1 per cent., and it has since fallen to 8·1. Moreover, the mean of the five antitoxine years (10·2) scarcely exceeds the minimum in any year in any of the other towns. It is therefore very unlikely that it was anything like so low as this before 1895.

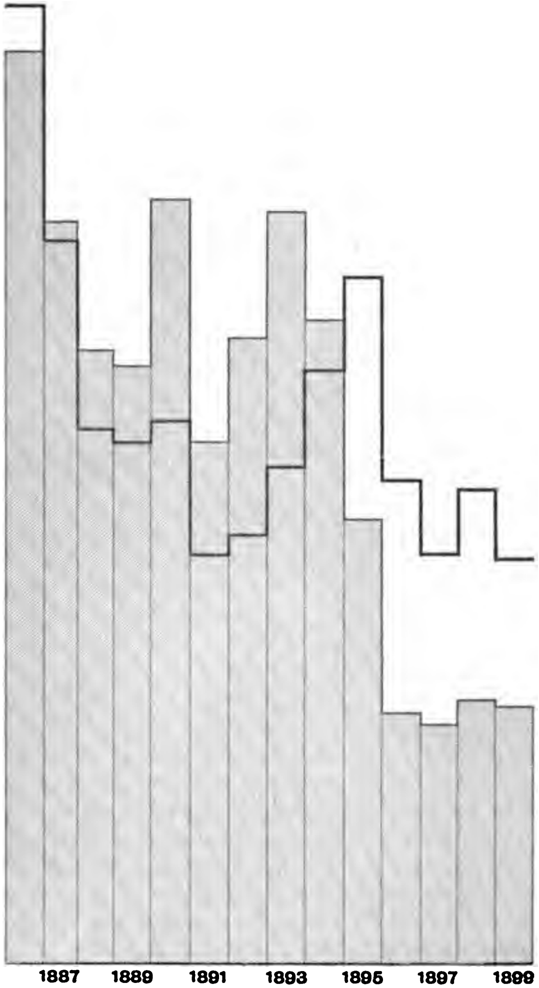
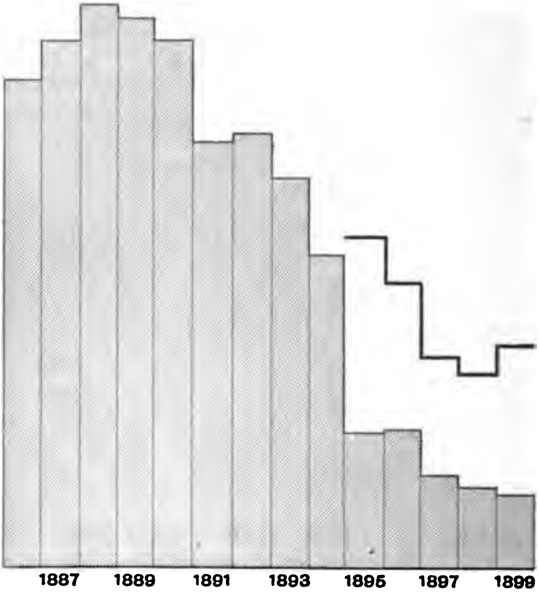


TABLE XI. (BERLIN).

Year.	DIPHTHERIA.					
	Death Rate per 100,000 Inhabitants.		Notification Rate per 100,000 Inhabitants.		Death Rate per 100 Notifications.	
1886	121·8	90·6	510·8	304·0	23·8	29·8
1887	98·4		384·3		25·6	
1888	81·4		285·5		28·5	
1889	79·5		277·2		28·7	
1890	101·4		290·5		34·9	
1891	69·2		219·3		31·6	
1892	83·0		227·7		36·4	
1893	100·0		263·5		37·9	
1894	85·4		315·0		27·1	
1895	58·8	38·5	364·0	260·2	16·2	14·8
1896	32·9		255·9		12·9	
1897	31·8		216·6		14·7	
1898	34·9		251·1		13·9	
1899	34·5		216·2		15·9	

In Berlin the diphtheria death rate fell rather less abruptly—from 85·4 per 100,000 in 1894 to 58·8 in 1895, and 33 in 1896. Since that year it has remained about the same level.



The mean annual diphtheria death rate during nine pre-antitoxine years was 90·6, that of five antitoxine years was 38·5, a decline of 57·5 per cent.

This immense decline in the diphtheria death rate is due, not to any diminution in the amount of disease, but almost entirely to an increase in the proportion of recoveries. The recovery rate is now indeed more than double what it was before antitoxine was used.

Having considered the returns of the several towns separately, we will now proceed to summarise the facts.

In the following table, the two periods, namely, that which preceded and that which followed the general introduction of antitoxine in the beginning of 1895, are compared; the difference between the mean rates for the two being expressed as a percentage of the rate for the earlier period.

TABLE XII.—*Showing the Percentage Difference between the Mean Annual Death Rate from Diphtheria and Membranous Croup, of the two periods before and after the general introduction of Antitoxine at the end of* 1894.

	Change in the Death Rate per 100.	Change in the Case Mortality per 100.	Year in which Lowest Death Rate occurred.	Year in which the Lowest Case Mortality occurred.
London . .	+1·4 (*a*)	−26·5	1898	1899
Paris . .	−79	?	1899	1899
Berlin . .	−57·5	−50·0	1897	1896
Edinburgh .	−29·0	−29·7	1899	1899
Glasgow .	−53·0 (*b*)	−25·5	1899	1869
Liverpool .	+62·0	+7·2	1889	1893
Manchester .	−54·0	+8·9	1897	1892 & 1898
Birmingham .	+100·0	+12·5	1893	,,
Leeds . .	+86·0	?	1891	1899
Bristol . .	+0·4	−49·6	1889	1896
Newcastle .	−30·0	−10 (*c*)	1899	1897

(*a*) Or −8·2, including all kinds of croup.
(*b*) Or −54·0, including all kinds of croup.
(*c*) Diphtheria only.

Taking first the death rate, we find that a large fall has taken place in six of the eleven towns—namely, Paris, Berlin, Edinburgh, Glasgow, Manchester, and Newcastle, no considerable change in London and Bristol, and a great rise in Liverpool, Birmingham, and Leeds.

The table hardly does justice to the facts. In Liverpool, Birmingham, and Leeds there has been an epidemic increase of diphtheria during the antitoxine years, and there can be little doubt that the decline which has recently taken place in other towns would appear even more striking could we include all the deaths from diphtheria which have been ascribed to croup.

We find the mean annual case mortality from the causes in question was, during the five antitoxine years, considerably lower than that of the preceding years, in London, Berlin, Edinburgh, Glasgow, Bristol, and Newcastle. In Liverpool, Manchester, and Birmingham it was slightly higher. In Paris and Leeds the change is not known. Manchester is the only town which shows a fall in the death rate, and no corresponding fall in the case mortality. It is indeed an extraordinary exception to the general rule; for during the antitoxine period the average diphtheria death rate was among the lowest recorded in the British cities, while the case mortality was actually the highest.

It is unfortunate that we have no means of knowing to what extent antitoxine is used in the different towns under consideration. It is almost certain that it has only with difficulty and little by little been pushing its way, and we may safely assume that in some of these towns it was not very widely used in the earlier part of what we have called the antitoxine period. We should therefore expect that the case mortality of the later years of the so-called antitoxine period to be less than that of the earlier. This is actually the case in seven of the eleven towns; and the case mortality rate was at its lowest point in 1899, in London, Paris, Berlin, Edinburgh, and Leeds; while in Bristol and Birmingham it was very close to the minimum in that year.

The fall in the case mortality began abruptly in 1895, in London (13·6 per cent.), Berlin (40·2 per cent.), Edinburgh (12·7 per cent.), Glasgow (30·0 per cent.), Bristol (47 per cent.), and Newcastle (16·6 per cent.); and probably in Paris also, for we find already in that year a case mortality of 10·1. In Birmingham and Leeds the fall began later.

TABLE XIII.

	DIPHTHERIA AND MEMBRANOUS CROUP.					
	Death Rate.			Case Mortality.		
	Mean of Years *preceding* | *succeeding* the general introduction of Antitoxine.		1899.	Mean of Years *preceding* | *succeeding* the general introduction of Antitoxine.		1899.
London . .	48·6	49·3	43·3	23·4	17·2	14·3
Paris (*a*) . .	63·9	13·3	9·4	?	10·2	8·1
Berlin (*b*) .	90·6	38·5	34·5	29·8	14·8	15·9
Edinburgh .	22·2	15·8	9·6	23·2	16·3	10·0
Glasgow . .	35·9	16·8	14·8	30·9	23·0	23·4
Liverpool .	14·8	24·1	32·6	27·7	29·7	27·5
Manchester .	30·7	14·1	15·4	28·2	30·7	34·1
Birmingham .	18·8	37·4	28·5	20·8	23·4	20·4
Leeds . .	22·3 (*a*)	41·5 (*a*)	82·3 (*a*)	?	23·6	18·6
Bristol . .	13·3	13·9	10·2	34·5	17·4	15·2
Newc'tle-on-Tyne	33·3 (*a*)	23·2 (*a*)	17·6 (*a*)	26·9 (*b*)	24·2 (*b*)	24·3 (*b*)

(*a*) Diphtheria and Croup. (*b*) Diphtheria only.

The changes which have taken place in the diphtheria death rate on the Continent are without parallel in this country. But that does not necessarily imply that the present state of our cities is relatively unsatisfactory. It must be remembered that before the introduction of antitoxine the death rate from diphtheria was very considerably higher both in Paris and Berlin than in any of the British towns under consideration. Even in London the average mortality was only three-quarters that in Paris, and little more than half that in Berlin.

The following table may be of interest as affording a basis of comparison of the state of our cities with that of other parts of the world :—

TABLE XIV.—*The Mean Annual Diphtheria Mortality per* 100,000 *before and after* 1*st Jan.* 1895, *in various parts of the world.*

	Before.	After.		Before.	After.
Bristol (*b*)	13·3	13·9	Paris (*a*)	62·2	13·3
Manchester (*b*)	30·7	14·1			
Edinburgh (*b*)	22·2	15·8	Berlin (*c*)	90·6	38·5
Glasgow (*a*)	43·8	20·2	266 German towns (*c*)	106·0	44·0
Glasgow (*b*)	35·9	16·8			
Newcastle (*c*)	33·3	23·2			
Liverpool (*b*)	14·8	24·1			
Birmingham (*b*)	18·8	37·4	Baltimore (*a*)	70·0	62·0
Leeds (*b*)	22·3	41·5	Chicago (*a*)	120·0	64·0
London (*a*)	56·0	51·4	Milwaukee (*a*)	135·0	73·0
London (*b*)	48·6	49·3	St. Louis (*a*)	117·0	75·0
			New York (*a*)	151·0	80·0
Queensland (*c*)	49–44	16·4	Brooklyn (*a*)	147·0	101·0
New South Wales (*c*)	43–47·7	18·4	Philadelphia (*a*)	101·0	110·0
Victoria (*c*)	45·4–39·8	19·7	Boston (*a*)	118·0	109·0

(*a*) Diphtheria+Croup. (*b*) Diphtheria+Membranous Croup. (*c*) Diphtheria only.

Some of our cities now compare very favourably with Berlin in respect to the diphtheria death rate, and are not far behind Paris; the average rate in London (the highest British rate recorded here) during the last five years is only one-fifth greater than that in Berlin. In seven of the nine British cities the diphtheria death rate during this period was lower than that in Berlin. In none was it so low as in Paris, but in Edinburgh the rate was only one-sixth greater than in that city.

The diphtheria death rates of our cities are very much lower than those of the United States. Dr. E. O. Jordan of Chicago[1] has published tables showing the changes in the annual diphtheria death rate in eight of these cities and in two of the States. After showing that considerable improvement has occurred in most since the introduction of antitoxine, he points out that the diphtheria death rates are still (1898) comparatively very high. He says: "The death rate in the pre-antitoxine period in all the American cities included in our tables, with the single exception of Baltimore, was higher than in Berlin and nearly twice as high as in Paris. The opportunity (for improvement) in all our cities was certainly great, and is still great, since in no American cities has the average mortality from diphtheria and croup fallen to as low a level during the antitoxine period, as prevailed in Paris during the pre-antitoxine period."

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[1] *Phila. Med. Journ.*, 18th Feb. 1899.

The number of years comprised in the periods "before" and "after" 1st Jan. 1895 are for the British cities, Paris, and Berlin the same as those in the tables. For the American cities and the collection of German towns the two periods are 1886 to 1894 and 1895 to 1897, except for New York, Chicago, Brooklyn, and Philadelphia, in which cases the antitoxine period includes 1898 also. The figures for the Australian Colonies are from Dr. Jefferis Turner's paper,[1] and refer to three periods, namely, 1884 to 1889, 1890 to 1894, and 1895 to 1898.

We have seen that in most of the cities mentioned in this paper, a remarkable fall, both in the diphtheria death rate and case mortality has occurred since 1894. Several causes have probably contributed to this change, and it is not possible to ascribe to each its due share. But I think that no one who has surveyed the figures collected in these pages, and who has duly considered the magnitude of the changes which have taken place, the remarkable way their commencement coincides with the introduction of the new remedy, and the sharpness of that commencement in those towns which we know were the most ready to adopt the new remedy, will hesitate to ascribe these changes to diphtheria antitoxine.

No doubt antitoxine might be used far more largely than it is in many parts of this country; and when we remember the deplorable amount of diphtheria in Paris and Berlin before 1895, and contrast it with the present condition of those cities, we cannot but feel that if the causes which have brought about those magnificent improvements were equally applied in our own country, our results even in Edinburgh and Bristol would be better than they are, and in towns such as Manchester and Liverpool they would undergo an immense improvement.

PREVENTIVE MEASURES.—Antitoxine can have but a slight and indirect influence upon the prevalence of diphtheria. The prophylactic use of this substance, in the case of children known to be exposed to infection, might be used with benefit more largely than it is. But there is much to be said on both sides of this question. The really effective weapon that modern discovery has given us is the bacterial test; and now that the diphtheria bacillus is known to remain long in the mouth of convalescents, some of whom may have been only slightly indisposed, and even in the mouths of apparently healthy people who have come in contact with the sick, we have the knowledge necessary to the effective use of that weapon. Those people who now carry about the infection must be sought out and isolated until they cease to be a source of danger to their neighbours.

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[1] *Brit. Med. Journ.*, London, 1899, vol. ii. p. 1409.

It needs to be brought home to the minds of many people, and I think also to those of many members of the medical profession, that diphtheria is not spread by bad drains and insanitary surroundings, as was formerly thought, but by *direct transference of the bacillus from mouth to mouth.* Children may live in the best of homes, but diphtheria will spread in schools, as long as those who harbour the diphtheria bacillus are not excluded, and the children have pencils and slates in common.[1]

The recent additions to our knowledge of the cause of diphtheria may be summed up thus:—

1. The disease is due to a specific bacillus.
2. The bacillus may remain in a dangerous state for a very long time in the mouths of those who have recovered, so that no convalescent can be declared free from infection within three weeks or any other specified period, but only after the disappearance of the specific micro-organism has been ascertained.
3. The disease itself may be so mild as to pass merely for a slight cold or sore throat, and may not keep a man from his work or a child from school. Fatal diphtheria may spread from such mild cases.
4. The bacillus may be harboured by those who, having come in contact with the sick, nevertheless remain quite well.
5. The disease is spread by mouth to mouth infection.

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[1] Dr. Wm. R. Smith, medical officer to the London School Board, whose book, "Diphtheria," I have only just seen, attacks the view that schools are largely responsible for the spread of diphtheria, and founds his argument mainly upon the fact that but relatively few children attend school at the ages when diphtheria is most common, viz. from three to six years. This fact, no doubt, shows that "age susceptibility is the main factor in selecting the victims of diphtheria"; but it does not seem to me to warrant the further conclusion that "school aggregation acts only as a slightly disturbing element." Though the most susceptible period of life is past in most cases before the children go to school, many cases of diphtheria occur among children of school age; and there can be little doubt that many of these children return to school with the bacillus still in their mouths. At schools the use of slates and pencils affords a ready means of transferring the bacillus from one child to another. Some of those who thus receive the infection may suffer only from a mild sore throat, not recognised as diphtheria, or they may not suffer at all, but yet nevertheless go home and communicate the disease to their little brothers and sisters. It may be said that this is mere hypothesis; yet I have known an outbreak of diphtheria among children spread in a similar manner by adults. In this instance the only explanation, after careful inquiry, was found in the fact that the fathers all worked together, and had shortly before suffered from colds or slight sore throats.

In reference to this last statement, I should like to mention a personal experience. Some time ago, Dr. Nuttall called my attention to the American habit of chewing gum, and told me that children in the States would often exchange the pieces of gum which had been for some hours in their mouths. Could any custom be more calculated to spread diphtheria, if it is true that the infection lurks in the mouths of those apparently well? The amount of diphtheria in the cities of the United States ought to be out of all proportion to that of European countries where the custom does not exist. I did not know at the time whether there was more or less diphtheria in the States than in Europe, but this led me to consult Dr. Jordan's paper, with the result that I found that the death rate from diphtheria in the best of the American cities mentioned by this writer was immensely greater than that of the worst of our own. In the pre-antitoxine days, no less than 147 persons, mostly children, used to die every year out of every 100,000 persons living in Brooklyn.

The disease in 1898 still claimed one victim each year out of every thousand persons living in Philadelphia, Brooklyn, and Boston, and if one takes the proportion of children of the age chiefly affected by diphtheria to adults as roughly about one to three, one child in every 330 dies each year from this disease alone. It is appalling! I do not know to what extent the habit of chewing gum exists in the different cities of the United States, but it certainly looks as if the disease was spread by the habit, and the facts just mentioned seem to me to support the theory of mouth to mouth infection, and shows the direction our preventive measures should take.

I venture to suggest some practical recommendations, in the hope of stimulating municipal authorities to consider what steps can reasonably be taken to stamp out diphtheria.

1. Medical practitioners should be urged to have all persons with suspicious sore throats, and all those who have come into intimate contact with the sick from this disease, examined by the bacterial test. And all those persons in whom the diphtheria bacillus is found should be isolated until the absence of this micro-organism has been ascertained.

2. All persons recovering from diphtheria, however mild the attack has been, should be isolated until the specific micro-organism has disappeared from their throats. If this is impracticable, adult convalescents should be warned that they are liable to communicate the disease to children, and children should on no account be allowed to go to school until a satisfactory negative test has been obtained.

3. Whenever diphtheria has broken out in a school or other institution, all the inmates should be submitted to the bacterial test, and those in whom the bacillus is found should be isolated until it has disappeared.

4. Every effort should be made in schools to prevent mouth to mouth infection.
5. A competent bacteriologist should be appointed in every large town to make the necessary examinations.

No doubt many practical difficulties exist in the way of carrying out these or similar recommendations,—principally, no doubt, the want of co-operation on the part of the public. The public need to be informed by the medical profession of recent advances in our knowledge of disease, but are too frequently told instead that those so-called advances are colossal mistakes. Let the public once believe that we now know the lurking places of the agents of diphtheria, and have the means to hunt them out and destroy them; that we have at the present moment the power to stamp out one of the worst diseases, if they only would empower their civic rulers to employ it, and diphtheria would disappear, like the ague. With such opportunities as we possess, it is criminal to neglect them. Let us therefore do each what we can to cultivate a sound public opinion on matters of health.

THE THEORY AND PRACTICE OF THE TREATMENT OF RINGWORM OF THE SCALP.[1]

By W. Allan Jamieson, M.D., F.R.C.P.Ed., *Lecturer on Diseases of the Skin, University of Edinburgh.*

It has appeared to me that an excellent object lesson with which to commence the study of diseases of the skin, would be a consideration of the various plans which have been devised from time to time for the cure of ringworm of the head in children. In perfect health, and if carefully managed, our integument is all but impenetrable to micro-organisms. For their successful lodgement a vulnerable spot must be found, and this is not present in the undamaged plain of the normal corneous layer, but may be discovered in the crypts and follicles which stud its surface. Introduced within these, the parasite has time to develop and to obtain a hold, nay for a time at least to defy all our efforts to dislodge it. Why the scalp of children under the age of 14 or 15 should provide a soil so suitable for the growth of the trichophyton, and why just at that age a change occurs, which renders it no longer fit for its continued existence, we cannot perhaps satisfactorily explain. That there must be a variation in the tissues at that epoch is evident, since the most important alteration that takes place in the constitution occurs then.

There are peculiarities connected with the hair follicle itself which demand attention. In the deeper part, where the hair takes origin, its bulb fits closely to the follicular walls, being

[1] Part of a Clinical Lecture delivered on 2nd May 1900 in the University Theatre.

separated from these only by the root sheaths, themselves active. But precisely where the sebaceous gland pours in its secretion, then fluid, a constriction arises. Here the hair imbibes the lubricating material destined to keep it pliant. Above this the neck widens like a funnel, but the space is filled with epithelial débris, and any over-plus of sebum, even in health. When the scalp is attacked by the trichophyton, the mycelium creeps down into this, and there further stimulates unnatural epidermic proliferation. Hence the upper part of the follicle becomes choked with dry particles, at once caused by the parasite, and also furnishing the best and most congenial soil for its further development. This places an additional obstacle in the way of remedies intended to penetrate within the follicle.

The problem of the rapid cure of ringworm of the scalp is one which has for an indefinitely prolonged period exercised the minds of the medical profession. Before the establishment of the parasitic nature of the disease, all efforts in that direction were but gropings in the dark; and even now, when our acquaintance with the habitat and natural history of the fungus, on the vegetation of which it depends, has been gradually perfected, the results of treatment have not kept pace with our knowledge of its pathology. The fungi which occasion it may be divided into two groups, styled the small and the large-spored varieties. For the identification of these we owe much to the brilliant French observer Sabouraud, though his views have been slightly modified by Leslie Roberts, Colcott Fox, Blaxall, and Adamson among others. If the large-spored is a little less obstinate, and though untreated persisting to a later age, it is much the rarer in this country; if the small-spored is rebellious, yet it tends spontaneously to disappear about puberty. The tenacity of both forms is due to several factors, in addition to the structural ones already alluded to. One of these is the brittleness of the hair which the erosion of the cuticle and the dissociation of its fibrous structure by the invasion of the mycelium and spores, or more properly short filaments, gives rise to. Another is because the fungus extends its growth downwards almost if not quite to the extremity of the bulb. And, lastly, the tenderness of the scalp in children, necessitating care in the choice of our agents of destruction.

As in all rational treatment, the first point to which attention ought to be directed is to ascertain the method of natural recovery, as in that way we may draw inferences of much value. Now it would appear that what may be termed idiopathic cure arises from the gradual shedding of the diseased hairs, and their replacement by healthy ones. We can observe this by watching a patch of ringworm closely for some time. We can see that, among the manifestly morbid hairs, there crop up sound though fine ones, which attain a considerable length, and in fact by their increasing numbers, may over-shadow those still affected, and lead to a premature presumption of cure. Aldersmith is correct in saying that, before ringworm is well, all the diseased hairs must be got out of the follicles. How nature accomplishes this is still undetermined. It may be that the process of normal moulting is accelerated, or that the toxines produced by the fungus have a degree of depilatory power; it can scarcely be the amount of inflammation evoked. Let us now consider the suggestions whereby the natural procedure may be imitated.

One effect of the growth of the trichophyton in the epidermis is to render the surface dry and scaly. This has been assumed as an indication of an attempt at cure. Hence Cavafy and Morris have advocated an artificial augmentation of the dryness, in the hope that in this way we may loosen the hairs more rapidly. The plan adopted is to apply several times a day a solution of boric acid in ether and spirit, the scalp being kept thoroughly clean by washing with soap and water at least once daily. The best formula for the lotion seems that given by Aldersmith, who claims that sometimes it causes the hair to fall rapidly out, leaving smooth, bald places, resembling alopecia areata. ℞ Acidi borici, 1 oz.; ætheris meth., 10 oz.; ol. rosmarini, 2 drms.; sp. meth. ad 40 oz.—*M.* It is certainly a cleanly method, if its efficacy could be relied on, but it is only exceptionally curative,—in my experience very exceptionally, though at one time it was subjected by me to prolonged trial.

Occasionally in ringworm of the scalp, and constantly in ringworm of the chin in men, we meet with œdematous swelling of the integument, with inflammation of the follicles, which causes them to gape and pour forth a glutinous or puriform secretion. This, when it attacks the scalp, is known as kerion. It occasions such a loosening of the hairs that they either spontaneously fall out or are removable painlessly with the least traction. If the condition extends over the whole area involved in the disease, the result is cure after a time, since, with the disappearance of the hair and its root sheaths, the pabulum for the fungus is no longer provided, and it perishes from inanition. The property of croton-oil, when applied to the skin, of evoking a pustular eruption, is well known, and was made use of at one time and perhaps even yet as a counter-irritant. It occurred to Aldersmith to adapt this pustule-producing power of the oil to start an artificial kerion, and thus float as it were the diseased hairs from the follicles. There are, however, certain drawbacks to an extensive employment of such a remedy. The pustulation is apt to be excessive, and not always limited to the area to which the oil has been applied. Besides, it extends pretty deeply, and may eventuate in permanent scars with baldness, a result which never happens from ringworm, and but very rarely follows kerion. It cannot be practised over large spaces, nor in young children. It needs constant and skilled supervision. He first has the part carefully cleansed, then painted with a minute quantity of pure croton-oil, allowed to dry, and then a linseed poultice is put on, as suppuration is to be encouraged. Next day the part is inspected, and if no irritation or folliculitis has shown itself, the oil may be reapplied, and this with continuous poulticing is persevered in till folliculitis appears. When it is found necessary to watch the effects of a remedy so closely as one has in this, it is evident that its use must be a restricted one. It is not an absolutely certain cure either, so that it must needs be reserved for very special and selected cases.

Another idea is held by some, namely, that resistance to treatment is ascribable to the presence of the fat secreted by the sebaceous gland, which in a measure favours the growth of the parasite, and if removed our remedies would penetrate deeply enough. Were this view correct, then a plan which has been recently strongly advocated is theoretically a good one. This avails itself of the property of turpentine to dissolve fat, and this is therefore employed to enable us by its aid to reach the base of the follicle. After shaving the head, turpentine is poured on the parts affected, and is allowed to remain for a couple of minutes, so as to give it time to soak in; it is then washed off with soap and water, more turpentine again poured on, and immediately afterwards tincture of iodine. The theory is, that the iodine will be carried down by the turpentine. The rest of the scalp is smeared with carbolic glycerine. The treatment is repeated three times a week. It is claimed that in this way a cure is effected in six weeks. In order to thoroughly test this method, a suitable case was selected, and was admitted into my ward on 2nd February 1900. The patient was a healthy girl, æt. 5, who came from the country, and had had the complaint for six months. There was only one patch the size of a florin, seated on the front of the scalp. Nearly all the hairs were diseased, and exhibited the usual characters of the small-spored variety of the parasite. The treatment was commenced at once, and carried out by myself for fully six weeks. At the termination of that time there was no change whatever. The area was as great, and the number of diseased hairs had not diminished. The hypothesis that fatty matters feed the parasite is at best a doubtful one, since the trichophyton flourishes most luxuriantly in dry epithelial tissue. It is quite possible that it may succeed in some, but Aldersmith, who has also tried it, says "it almost always fails to cure the disease."

We have seen that there are obstacles in the way of loosening the hair in the follicle, yet epilation as an auxiliary method is recommended by many authors. Unfortunately the growth of the parasite within the substance of the hair so dissociates its fibrous structure, that it is thereby rendered brittle and breaks off at or just within the follicular mouth, when traction is exerted.

It occurred to me that it might be possible to harden or tan the hair, and so reduce its friability as to render its entire extraction feasible if cautiously attempted. Trial was therefore made of tannic and chromic acids, and other bodies which tend to toughen the skin, but they did not impart the necessary tenacity; and though some hairs did come wholly out, they were the exception. We must bear in mind that we are dealing with an epidermic tissue, which, though fibrous in texture, is totally different from the collagenous material of the true skin. Hence one reason of failure, but it may yet prove practicable.

Another mode of coping with ringworm is that of producing a special form of dermatitis, and thus nullifying the further growth of the parasite by acting on the soil. Many substances have been used for this purpose at various times, and, indeed, Thin among others holds that a certain degree of irritation of the skin is necessary for successful treatment. Acetic acid, which swells up the integument, has sometimes been effectively employed in the early stage, and carbolic acid, which coagulates the albuminous elements, has likewise in similar circumstances been applied felicitously. The drug, however, which at present enjoys the widest reputation, is chrysarobin. Morris places it in the first rank, and considers that it produces a change in the skin which is something more than a simple inflammatory one; while Hutchinson has recourse to it in all rebellious cases. It has disadvantages, inasmuch as it stains the skin yellow and its coverings purple; but more serious than that, unless it is employed with the very greatest care, it is apt to induce a troublesome conjunctivitis. Its fame is really owing to its being used in the form of Goa powder in India, to cure a form of ringworm affecting the skin alone, prevalent there and in warm climates, but it is questionable if it possesses any special curative action on ringworm of the scalp. To determine this, some years since the following test was instituted by me:—A girl who had extensive ringworm of the scalp of the small-spored variety, had her head shaved and well washed. Then a solution of chrysarobin in chloroform was painted thickly on, and covered with a layer of zinc gelatine and wool. This was bathed off twice a week and the chrysarobin reapplied. After two months of this treatment, there was no improvement perceptible. It has also been used by me in the form of an ointment for considerable periods without obtaining a cure thereby. The first of these modes was a suggestion of Unna's. Here it may be observed that all methods of treatment of ringworm of the scalp which hail from Germany are to be regarded with suspicion. Not because they are not well planned, but because ringworm of the scalp is excessively rare in Germany, and when it does occur is not apparently so intractable as in Britain and France.

Instances of loosening of the hair, and even of partial baldness as a result of the application of the X-rays, has led to the suggestion that this method might be advantageous in favus. Scarring as a consequence of the long-continued presence and growth of the *Achorion schönleinii* in the scalp is such a usual event, that even if artificially brought about, provided the favus were cured, it would not be a very serious matter; but it is wholly different in ringworm, where subsequent alopecia is quite exceptional. X-ray dermatitis, if at all severe, is apt to be followed by sloughing and the occurrence of a gap which is particularly slow to heal over. And this is not all. It is by no means so easy to cause the hairs to fall out when you wish them, by employing the X-rays, as some would lead one to suppose. In illustration, a case of favus was treated by me, with the assistance of Dr. Hope Fowler, then my house physician, for two months. There were twenty applications for five minutes each at a distance of just 6 in. The coil gave a spark of 10 in., and the strength of the current was 4 volts. Epilation was practised continuously by my nurses, but no difference in the ease of extraction was perceptible, and there was no spontaneous falling out whatever. As a means of curing ringworm, therefore, entirely apart from the trouble and time and expense required, we may for the present set aside the X-rays.

While there are many other remedies which have been proposed for the cure of ringworm, these may be taken as the chief and as typical of all, for it is of no use to speak seriously of watery solutions, such having no penetrative power whatever. It will almost appear as a deduction from what has been said, that the cure of ringworm of the scalp is unattainable, that we must be content to wait till, with the advent of puberty, the disease dies out, merely intervening with such remedies as may tend to limit its spread and to diminish as far as possible its contagiousness to others. The anatomical reasons which have been given support this pessimistic view, and the impenetrability of the epidermis, when healthy and uninjured, to drugs applied to its surface, would seem to substantiate it. But pathological changes come to our assistance. The epidermis of the affected area in ringworm is not healthy; it is, on the contrary, in the abnormal state known as parakeratosis, that is, its cornification is imperfect. Instead of a dense smooth surface, it is rough and scaly. In place of its limiting cells being firmly soldered together, so as to form a uniform keratinous plate, they are broken up and dissociated. The cells themselves are spongy and do not contain in perfection the fatty material which does so much to preserve their pliancy. Hence Unna remarks that, in contrast to a normal corneous layer, a parakeratosed one is almost too permeable. The more fluid the fatty menstruum, the more readily, *cæteris paribus*, can it be made to insinuate itself, and the more persistently it is rubbed in the better will be the result. We can, undoubtedly, very materially shorten the duration of any case of ringworm of the scalp, but we cannot fix a limit within which a cure may be certainly expected. Some examples yield rapidly; others, apparently similar, resist most obstinately. One reason may be that the directions are not always followed with equal faithfulness, but the soil has perhaps more to do with intractability than conscientiousness of application.

In treatment, therefore, the following are the rules to be observed:—(1) The hair must not only be cut or shaved off, but the entire scalp must be kept bare of hair, by razor or curved surgical scissors, till the cure is complete. In this there can be no compromise. Those in care of the child are apt to evade this injunction, on the ground that to them the disease seemed cured; but the doctor, aided by the microscope, ought alone to be the ultimate judge as to when the hair may be allowed to grow. (2) Again, the scalp must be kept rigorously clean. It must be washed twice daily with a fluid superfatted potash soap and warm water, the soap being poured on a piece of wet flannel and moderate friction employed. Such a soap only will keep the surface soft, polished, and adapted for the reception of remedies. The affected areas usually show a pinkish tint, as compared with the healthy, while the diseased hairs do not all grow in the proper direction. The application which has proved most efficacious in my hands is one modified from an old formula of the late Sir William Jenner. It consists of precipitated sulphur, 1 drm.; salicylic acid, β-naphthol, and ammoniated mercury, each 10 grs.; and lanoline, 1 oz. For lanoline we may perhaps substitute vasogen, an oxidised vaseline, which is credited with enhanced absorptive powers, but my experience of it is yet too small to enable me to speak with confidence. One point is of great consequence, it is that the ointment be rubbed in for ten minutes slowly and carefully twice a day. In this way the epidermis becomes charged with the antiseptics, the sulphur, mercury, and naphthol, while the salicylic acid favours the moulting of the diseased hairs while increasing the porosity of the skin. In compounding we may replace the naphthol by thymol, or we may use in exchange a salve of oleate of copper in the proportion of 25 to 50 grs. to the ounce. Whatever we use the principle is the same, the steady saturation of the permeable epidermis with substances hostile to the fungus. In this way, and in this way only, in the present state of our knowledge, by patient insistence we can cure the most refractory instances of ringworm of the scalp.

CROSS INFECTION, SO CALLED, IN FEVER HOSPITALS.

By CLAUDE B. KER, M.D., M.R.C.P.Ed., *Superintendent, City Fever Hospital, Edinburgh.*

WHEREVER large numbers of children are congregated together, whether in schools or in hospitals, there is always a risk that infectious disease may break out among them. It would seem, then, a perfectly logical deduction to make, that this risk will be materially increased if the place in which they are congregated happens to be a hospital in which infectious disease is treated. And so it is not surprising to find that many parents have a strong prejudice against sending their children into a fever hospital, lest they should, while resident there, contract another infection. And in this prejudice they are frequently encouraged by their family physician.

The hospital with which I am connected has, I am afraid, not a very good reputation as regards what is ordinarily known as cross infection, and I propose to consider how far that reputation is or is not deserved, and at the same time to remove some misapprehensions which apparently exist as to the nature and causes of this not infrequent occurrence. By cross infection is usually understood the contraction by the patient of some infection, other than that for which he was originally admitted. And it is always presumed that the second infection is derived, directly or indirectly, from patients who are being treated for that infection in some other part of the hospital.

Last year the City Hospital suffered rather more than usual as regards cross infection. I have tabulated the number of patients treated for each disease, and the number who contracted a second infection, noting the percentage in each instance.

Of 1034 cases of scarlatina, 38, or 3·67 per cent. took measles.
,, ,, 4, or ·38 ,, took varicella.
Of 331 cases of measles, 8, or 2·4 ,, took scarlatina.
Of 147 cases of diphtheria, 4, or 2·7 ,, took scarlatina.

Of these figures, I need only say that while the number of diphtherias which took scarlatina is about the normal, the other percentages are much higher than usual. It may also be noted that, of 472 patients admitted with infections other than the above, none took any other disease.

And now for the explanation of this state of affairs. The views most generally held by our critics outside may, I think, be fairly stated as follows:—(1) The second infection is contracted from patients suffering from that disease in other parts of the hospital. (2) That in many cases it is carried by the air. (3) That it is carried by the officials from one ward to another. (4) That the nurses mixing at meals contaminate each other, and the patients under their charge. (5) That wards which have been used for the treatment of one disease are not properly disinfected before another disease is nursed in them.

It will be noticed that all these alleged causes depend on the assumption that the second infection is carried from patients in other parts of the hospital. While I am perfectly prepared to admit that such may be the case in certain rare instances, I assert that this method of infection is not at all a common one. For example, at the time measles first appeared in my scarlatina wards, the winter before last, not only were no cases of that disease being treated in the hospital, but there had not been a case in the ward where it broke out for over a year, although dozens of susceptible cases of scarlet had been treated there in the interim. Again, outbreaks of measles occur not infrequently in the magnificent hospitals of the Metropolitan Asylums Board, where measles cases are not treated at all.

As regards the carrying of infection by the air, as far as the City Hospital is concerned, it may be of interest to note that its measles wards are below those which are used for typhoid, and may be almost said to ventilate into them by a staircase guarded only by a swing door. The scarlet wards are on the same flat as those for typhoid, and a similar swing door, used frequently by the medical and superintending staff, alone separates them.

I really hardly expect to be believed when I state the absolute fact that in the four years during which I have been in charge of the hospital, not a single typhoid case, though at least 400 children must have been through the wards in that period, has developed either measles or scarlatina. Again, smallpox, that infection which of all others is most regarded as aerial, has before now been nursed in the narrow limits of our courtyard without accident. I have seen, on the other hand, two cases of true cross infection in the last four years, which were, I am convinced, due to aerial infection. Both were cases of measles, both were treated at different times in the same private ward, and both contracted scarlatina. The ward which they occupied is in an angle of the courtyard, and its window faces at the distance of a few feet a window of a scarlatina convalescent ward. When both windows were open it was easy to see that infection could be hardly avoided. I need not add that we are now careful whom we put in that private ward. But the case is altogether an exceptional one.

As regards the question of infection being carried by the staff, I quite admit that there must always be some slight risk of it. I have satisfied myself that a few cases of diphtheria have been so infected with scarlet, a disease to which they seem to be peculiarly susceptible. A doctor is very likely to be summoned in a great hurry to the diphtheria wards,—it may be from scarlet wards; an urgent message to see a diphtheritic croup may be the cause of some carelessness in personal disinfection. Latterly, my regulations for the protection of the diphtheria cases have been more stringent, and there has been no outbreak of scarlet which could not be more probably accounted for as being due to some more obvious cause.

That nurses occasionally infect each other in the dining-room is perfectly true, but I have no reason to believe that they have time to carry their disease to their patients before we isolate them. We propose in the new hospital, however, to make arrangements whereby the scarlatina nurses may be kept quite separate from the rest. The last cause alleged by our critics is want of proper disinfection of wards. In my experience our disinfection is quite efficient, and any outbreak which may occur in wards, which have been used for another disease at some previous period, can always be accounted for in a much more obvious manner.

So much, then, for the alleged causes of the outbreaks which we are considering. For the real cause we have not to look far, it is imported infection. The most of our cross infection, in fact, is not cross infection at all; it does not come from other parts of the hospital, but from outside. And it may be introduced in a variety of ways.

First, it may be due to a wrong diagnosis made outside. I have often seen difficult cases of scarlet and diphtheria, or of scarlet and measles, confused. We, of course, do all we can to check the diagnosis on admission, but in many cases no signs of any disease at all are visible on admission, and if we did not accept the diagnosis, which is, of course, in the vast majority of cases perfectly correct, we would be compelled to isolate nearly a fourth of our admissions, which is manifestly impossible. For, even given the requisite number of isolation wards, it must be remembered that each case would require at least one, if not two, special nurses, that is, if the isolation is to be effectual. Occasionally, therefore, a case sent in as measles, and presenting no symptoms on admission, is found some days after to be desquamating, obviously from scarlatina, and it may or may not have infected others before we can get it removed.

Secondly, it may be due to a patient being admitted with two diseases, only one of which has been diagnosed. It is, I suppose, not necessary now-a-days to point out, that two infections can exist simultaneously in the same patient. Not only is it possible, but it is comparatively common. Dr. Johnston, in his report of the Glasgow Fever Hospitals for last year, notes no less than seventy-six cases admitted with two concurrent infections, and three in which three infections co-existed. In the last three months alone we have admitted more than a dozen. It will be readily seen how easy it is to miss one disease when another is quite obvious, and it may happen that attention is first drawn to the existence of the second infection by an outbreak of it in the other patients in the ward. It was in this manner that scarlatina got among our measles and diphtheria patients last year.

Thirdly, and lastly, it is due to the admission of patients who are suffering from one disease and incubating another. The second infection, in the great majority of cases either measles or varicella, is developed some days after admission. This is by far the most common of the causes of so-called cross infection, and it is quite impossible to avoid. For the period of incubation presents no symptoms, and diseases which are infectious in their early stages only require a few hours in which to infect a whole ward. The outbreaks of measles among the scarlet cases in the City Hospital last year were due in both instances to cases of this kind. Dr. Johnston, in the interesting report above alluded to, notes twenty-seven cases of this sort were admitted into the two Glasgow hospitals last year, and naturally caused infection in others.

It will be seen, then, from the above, that most of our second infections can be traced to the causes which I have given, and not to those which seem to be commonly supposed to be responsible for such outbreaks. And therefore it is clear that we will continue to have trouble of this sort, even after we occupy the new hospital which is in course of construction. The number of outbreaks will remain proportionately the same, but, owing to the fact that each individual ward can be completely isolated, the number of patients exposed in each case will be very considerably less. I hope, therefore, that there will be some diminution in the number of persons affected, but it is as well to recognise that no fever hospital, however modern, however perfectly administered, can expect immunity from these distressing accidents.

ON SOME MEDICAL SUPERSTITIONS.[1]

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WHEN we look back from these days of enlightenment and scientific progress to the stages by which this position has been attained, and to the tedious steps with which medical science has gradually advanced in its onward course, we can hardly fail to notice that the mind of man has always evinced a preference for the marvellous and the extraordinary rather than for what is rational but prosaic. And this love of the marvellous has not only had an attraction for the foolish and the ignorant, but even some of those who have acquired well-deserved reputations for their wisdom and ability in the ordinary affairs of life have readily fallen victims to it, and yielded to the specious arguments of some knave who appealed to their credulity and their superstition. "Man," says Southey, "is a dupable animal; there is scarcely anyone who may not, like a trout, be taken by tickling;" and if we hold this to include women also, we explain to a certain extent the success which even to-day attends the efforts of fortune-tellers, palmists, astrologers, and phrenologists. Not only are some individuals more ready to yield to the charm of the marvellous than others, but so also are certain nations, and those not behindhand in boasting of their reputation for superiority both in literature and learning. Superstition has been defined as a creed of the past, as opposed to religion, which is a creed of the present; and many of the superstitions which still survive at the present day can be traced back to beliefs which held sway long before medicine was in existence or surgery was even a name, when all diseases were ascribed to the anger of the gods and the wrath of Heaven, and could only be cured by appeasing the Deity. Celsus says expressly, in the preface to his work, "De re medica," that "diseases are to be referred to the immortal gods, and can be cured by them alone;" but he adds, with more good sense than consistency, that we are at the same time to rely on remedies for their cure—"morbi non eloquentia sed remediis curantur." But the nature of the remedies appropriate to any special disease was so little understood, and the science of medicine so imperfectly developed, that nature was left almost entirely to herself to repair the injuries and diseases of mankind, and we can hardly wonder that very great reliance was placed upon the power of intervention of the all-powerful gods to check the baneful influence of evil spirits.

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[1] Abstract of a Lecture delivered before the Medical Society of the Middlesex Hospital.

The disease-demon has always been a prominent figure among savage races, and exists in many parts of the world even up to the present day. Some Malay tribes, in their simple theory of diseases, are content to say that one kind of demon causes smallpox, another swellings, another insanity, and so on; and, as a natural consequence of these theories, it follows that the best treatment for such diseases is the exorcism of the spirit which is causing them. Considerable interest attaches to the transition period, when in ancient Greece and Rome the advance in medical knowledge caused some to question the old theories, that a fit was caused by the attack of a demon, and that fury or madness was due to demoniacal possession. In the Bible are recorded examples of possession by evil spirits, where the patient can even give the name of the spirit possessing him, and answers in his name when addressed. Even in the eighteenth century was published, with ecclesiastical approval, a regular exorcist's manual, and a notable case occurred in England as late as 1788, when an epileptic named George Lukins of Yatton was cured of seven devils at the

Temple Church at Bristol, the devils being exorcised by seven clergymen. It is true even now that "disease naturally awakens fear, and both fear and ignorance are the natural parents of superstition"; hence the introduction of a myriad superstitions, rites, and ceremonies; hence, too, the introduction of many extraordinary remedial agents which were thought to have a specific influence on disease.

In certain parts of France it is the custom to treat ulcerating cancer by the application to the surface of the ulcer of a portion of fresh meat, in order to appease the voracity of the gnawing disease, or, perhaps we ought to say, of the hungry psorosperms which cause it.

A physician practising in Tennessee has vouched for the employment in his immediate neighbourhood of various therapeutic measures which are, to say the least of it, not usually described in medical text-books. For instance, a splendid remedy for shingles is said to consist in cutting off a black cat's tail and applying some of the blood to the eruption; by this means the disease is rapidly and easily cured. A remedy for toothache, used in Tennessee, is to drop the blood of a snapping-bug into the ear, and an infallible one it is said to be; while they also cure cramp by giving the patient nine sow-bugs in emulsion. I gather that it is dangerous to give either more or less than the exact number. In the south of Ireland an almost universal remedy for measles among the ignorant is hot porter and sulphur when the rash first comes out, to be followed later on by the administration of new milk. It is well known that down to the time of Sydenham a peculiar efficacy was supposed to attach to the employment of preparations of "mummy" in certain diseases, and marvellous cures have from time to time been ascribed to it.

Among Hindoo physicians it is held to be of great importance to consult the omens before attending on a patient. By this means the physician is enabled to foresee the result of his treatment to the patient, and the knowledge no doubt enables him in many cases to make his arrangements accordingly, and to avoid some of the dangers which are in certain parts of India apt to follow unsuccessful medical treatment. If, on his way to the patient, he sees a kettle-drum, an umbrella, or a mongoose, the patient will get well; but if he sees a jackal, a corpse, or a crow, woe betide the patient, whatever his treatment may be.[1] In such cases, it is recommended by some authorities that the physician obtain his fee in advance, as also when the patient comes complaining of loss of memory.

But while deploring the influence which superstition has always had in retarding the advance of true medical knowledge, and the progress of scientific research, far be it from me to assert that remedies are not to be employed in medicine because their action is not understood. Empiricism and experimentalism in medicine are, to a certain extent, not only rational and valuable, but absolutely necessary. It is a trite and well-founded saying that "Ars medica est observationibus"; one simple fact in medicine is worth a world of reasoning, and however much we may argue and theorise, as we imagine scientifically, still we are frequently obliged to act empirically. It is important to remember that in medical matters undue scepticism is often as dangerous and as much to be condemned as undue credulity; in many cases we are bound to believe what we can neither understand nor explain. The so-called specific action of certain medicines in influencing the course of some diseases is still to us in many cases quite inexplicable, and yet we are bound, in duty to our patients, to employ these remedies when called upon to treat the disease. For instance, notorious as are the facts relating to immunity, it would be rash indeed to say that any of the theories which have up to the present been advanced in explanation are completely satisfactory, and can we even with truth say that we know how or why the inoculation of vaccine virus protects against smallpox? And yet who for this reason would refuse to vaccinate? Scepticism, then, in medicine, which is largely and of necessity a science of facts, acts as injuriously as superstition.

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[1] Singh Jee, "History of Aryan Medical Science," p. 165.

On the other hand, as has been well said by Flood (to whose article on "Superstition" I am indebted), "there are many dogmata and doctrines so repugnant to our reason, so opposed to common-sense, so contrary to established laws, not only of science but of nature, that we are bound to disbelieve them, even in the face of many, at first sight, apparent proofs; for when men are wedded to a doctrine, or fancy they have made a discovery, or have any interested motive to serve, they seldom fail to give every weight to their case by many dazzling experiments, and with them every unimportant incident is turned to account." Such are the men who, with the deliberate intention of imposing upon the ignorance and credulity of the public, blazon forth some nostrum which they assert to be a panacea for all human ills, or uphold some doctrine which they know to be chiefly, if not entirely, false; and partly to obtain notoriety, partly for still more sordid ends, oppose themselves to the advance of knowledge and the cause of truth. Perhaps in some instances there may be some grain of truth underlying the mass of falsehood with which they surround their discovery, and the specious arguments which they advance in its support appeal then all the more strongly to the weakness and credulity upon which their hopes are based, and make its refutation all the more difficult. Thus it comes about that popular superstition not only tends to create a direct danger to the public at large, but also, by giving importance to that which, if carefully investigated and analysed, would be unhesitatingly rejected, successfully interposes an obstacle to the advance of medical knowledge.

It is hardly necessary for me to recall to your recollection the various phases of the pursuit of the philosopher's stone, and the efforts made by the alchemists of the fourteenth and fifteenth centuries to find out a path to immortality. In seeking for some method by which the baser metals might be transformed into gold, they thought to discover how the enduring properties of the precious metal might be transmitted to the human frame, which would thereby be enabled to withstand the ravages of disease and death. Helvetius and others brought forward what appeared to be absolutely conclusive evidence that the transmutation of metals could be, and had been over and over again accomplished; and, indeed, when we consider what the condition of chemical science then was, it does not appear very wonderful that this evidence was very generally accepted. Yet, in spite of all this, the discovery of the elixir of life and the philosopher's stone has long ago been consigned to well-deserved oblivion, and even modern chemistry has been unsuccessful in finding either an elementary substance or a synthetic compound which has the power of rendering man immortal.

Astrology, again, was a science which attracted numerous devotees; a knowledge of astrology was held by Hippocrates to be essential to every physician, and Galen went so far as to assert that all who were ignorant of it were no better than homicides. Every individual was held to be under the influence of a certain planet; all that he had to do was to find out what other planet had an influence opposite to the first, and remove to a spot under its control, at the same time taking such remedies as were allied in influence to it. Such a belief of course opened up a most lucrative profession, and right well the astrologers seem to have profited by it. In 1773 there flourished an astrologist named Mr. Partridge, whose advice appears to have been much sought after, inasmuch as his accomplishments were varied and great. The following extract is from one of his advertisements:—"When most proper to bleed; under what aspect of the moon best to draw teeth and cut corns; paring of nails, on what day unlucky; what the kindest sign to graft or inoculate in; to open bee-hives and kill swine; with other notable questions fully and faithfully answered by me, Sylvester Partridge, student in physic and astrology, near the Gun, in Moorfields; of whom also may be had, at reasonable rates, antidotes, elixirs, washes for freckles, plumpers, glass eyes, false calves and noses, ivory jaws, and a new recipe to turn red hair into black." Modest as this advertisement is, it might perhaps be argued that Mr. Partridge promises nothing so marvellous as the miracles which are said to be performed in these days at Lourdes, or the cure performed by Prince Hohenlohe on the nun at Chelmsford, at a distance of some 300 miles.

A still more successful and hardly less modest schemer was—to give him his full title—Philippus Aureolus Theophrastus Paracelsus Bombastus von Hohenheim. Presuming perhaps on this name, he gave out that he was the prince of physicians, and that even the hair on his head knew more medicine than all the writers from Galen to Avicenna.

He asserted that he had discovered the tincture of life, the philosopher's stone, which he called "azoth," and that he had the power of making man immortal. Perhaps he was too altruistic; at any rate, he does not seem to have taken any of his remedy himself, for he died at the age of 48.

Towards the end of the eighteenth century, a Dr. Graham introduced mesmerism into England, and built himself a mansion which he called the "Temple of Health and Hymen." The rooms were splendidly furnished, and in one of the grandest was a celestial bed, standing on glass legs and gorgeously decorated, by sleeping in which childless married couples might ensure that they would have heirs. Although the price was £100 a night, it seems to have been difficult to engage it for a reasonably early date, so many were the applicants who wanted to try its virtue. An elixir of life was also discovered by Dr. Graham, and the price charged was proportionate to the powers which he claimed for it.

An equally disinterested practitioner performed marvellous cures in the early years of this century, and few men have more successfully traded on the superstitions and credulity of the public than John St. John Long. This worthy was the son of an Irish basketmaker, and, having picked up some knowledge of painting in oils, he was at first content to colour drawings for students at the various schools of anatomy. By this means he picked up a smattering of medical terms, and soon afterwards announced the discovery of a new and wonderful liniment. His house in Harley Street soon became crowded with patients, some hysterical, and some with nothing the matter with them, and among these his success was immense. He became a great favourite among ladies, and refused many offers of marriage. Unfortunately his luck began to change, and he was at last convicted of the manslaughter of a healthy girl, who died of gangrene produced by the application of his liniment to her back.

At the trial many of his lady admirers gave evidence in his favour, and a nobleman was found to swear that Long had extracted quicksilver from his head. Long was only fined £200; and when he was tried again for a similar accident shortly afterwards, he was acquitted. These trials rather increased his popularity than otherwise, as he proclaimed himself a martyr, but he died soon afterwards while still quite young. His admirers raised a handsome monument to his memory in Kensal Green, with a long and laudatory inscription, which did not, however, state that the liniment was simply composed of acetic acid, as was proved to be the case.

It would be a venturesome thing to say that the homœopathy of the present day was founded on superstition; indeed, homœopathy, as practised now differs very largely from the doctrines laid down by Hahnemann. His three dogmata or truths were—(1) That *similia similibus curantur;* (2) that seven-eighths of all chronic diseases are caused by psora, or itch; (3) that remedies must only be given in infinitesimal doses;—and it is of this last doctrine only that I would say a word. Hahnemann's preparations were given in doses diminishing up to what he calls the thirtieth attenuation;[1] and an idea of the potency of the drugs, when in such dilution, may be judged when we know that to obtain a grain of the substance in the third attenuation one would have to swallow four hundredweight of sugar; or, to get a drop of the original tincture, a barrel of alcohol would have to be drunk. Now this is only the third dilution. In the eighth attenuation, to obtain a drop of the tincture, the whole Atlantic Ocean full of alcohol would be necessary;[2] and we can imagine the effect of one-drop doses of the thirtieth dilution!

It may perhaps be urged that, regarded from a broad standpoint, the dissemination of such fallacies can only affect injuriously those who present themselves as ready dupes, but the results are, unfortunately, found to be more far-reaching.

For not only do the mischievous doctrines thus widely propagated obtain credence among a large section of the community, in preference to and to the detriment of well-determined but less showy scientific facts, and thus delay the extensive, if not universal, recognition of their truth to which these scientific facts are entitled, but they also make it necessary for those whose time would otherwise be profitably spent in advancing the progress of medical science, to step aside and point out the fallacies and the dangers which underlie these specious doctrines.

It is perhaps some slight consolation to think that occasionally a glimmer of truth does lie hid beneath the mass of falsehood with which it is encrusted, and that in the end the world is the richer by an addition, however small, to the store of knowledge which is ever slowly but surely accumulating.

[1] Black, "Practice of Homœopathy."

[2] Shepherd, "Medical Quacks," p. 15.

POINTS OF PRACTICAL INTEREST IN SURGICAL GYNÆCOLOGY.—II. SOME PITFALLS IN GYNÆCOLOGICAL DIAGNOSIS.

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(Plates IV.–VII.)

There are three attitudes the physician or surgeon may assume in coming to a conclusion with regard to the nature, probable course, and final result, in any given case in which his opinion is invited. He may feel himself certain of his ground, and assured of his certainty. He may clearly recognise the absence of signs, either positive or negative,—a recognition which brings home to him the difficulty of an assured diagnosis. Or an overweening confidence in his diagnostic infallibility may be due to the simple fact that he is unconscious of his ignorance. In other words, it is another reading of the old classification of those who "know that they know," those who "know that they do not know," and that most hopeless of all classes, those "who do not know that they do not know!"

It is doubtless most pleasant and most flattering to our sense of diagnostic acumen, to feel ourselves amongst the first of these divisions, yet unfortunately the sources of error in the novel and shifting character of the clinical features, subjective and objective, of each fresh case that presents itself to our notice, are such as very frequently to make it a new and complex study. The most dangerous diagnostician is he whose faith in his own experience prompts him to believe that he is more likely to be right than to be wrong. Hence he approaches a case with a prejudgment and bias, derived from impressions which colour and influence the deductions he draws from the clinical peculiarities now presented to him. He is consequently apt to overlook the unlikely sources of error, and does not proceed by a careful process of exclusion to satisfy himself that these are absent, his so-called "experience" thus leading him into the trap which is always open for the self-confident and dogmatic. Of course there is a fair proportion of cases in which the clinical and pathological characteristics are so allied, and the complications so few or comparatively unimportant, as to enable us with sufficient accuracy to arrive at a quick conclusion. These do not, however, come under the class that we are considering, and it is not in the instance of such that we have to be watchful of our impressions and suspicious of our deductions. Therefore, in the diagnosis of obscure abdominal and pelvic conditions, he is most likely to be right who finds himself amongst that class which is conscious of its fallibility.

In pelvic and abdominal surgery we have not only to satisfy ourselves as to the presence of some gross lesion in any particular organ, but we must also predetermine before operation, if such be decided upon, the nature and extent of those complications that may seriously affect or impede it. This involves not merely those associated conditions or actual connections which locally affect the diseased organ, but such constitutional states, diatheses, or diseases of other organs as may influence our opinion.

There is a large class of cases which appeals to gynæcologists for relief, in which the principal if not the sole trouble is a train of subjective symptoms. The physical signs which are indicative of deviation from the normal state of the pelvic viscera may be slight, inappreciable, or altogether absent; and, associated with this want of any evidence of a pelvic lesion, the presence of visceral neuroses, or reflected morbid phenomena, occurring in such organs as the brain, eye, ear, throat, and larynx, or the cranial nerves, may lead us to conclude that the origin of the mischief is not seated in the sexual organs. Doubtless such a conclusion is often due to an incomplete examination. On the other hand, it is not infrequently to be attributed to the erroneous conviction that because we are unable to detect gross lesions in the generative organs, the cause of the symptoms, either remote and reflected, or local and actual, do not lie in them. Many years since, I knew of a case in which, in my presence, the late Lawson Tait removed the adnexa from a lady æt. 32, who for eighteen years had suffered much, not only from her pelvic organs, but at the hands of many gynæcologists, including myself. For I, at the eleventh hour, had divided the cervix and enlarged the uterine canal, and subjected her to a prolonged course of high tension faradisation, without any benefit. Every internal and external prop had been tried, and the gynæcological therapeutics of the day exhausted. The patient was still the victim of aggravated dysmenorrhœa, severe hæmorrhage, and the increasing use of morphia. I advised removal of the adnexa, but as this had been before discountenanced by many leading obstetricians, it was considered right that a consultation should be held previous to the operation. Consequently, a distinguished obstetrician saw her, and decided that there was no disease of the adnexa present sufficient to warrant surgical interference, and that there was "no alternative but to leave her as she was." Mr. Tait, seeing her subsequently on the same day, with the other opinion before him, decided that it was a case for immediate surgical interference, which view was acted upon, and, under the circumstances, at my request, he operated, with the result that a complete cure was effected, which has lasted to the present day. The lady has been married for some time, and enjoys perfect health. Macroscopically, the ovaries were covered with minute follicular enlargements, and on section appeared rather hard and cirrhotic. The Fallopian tubes were healthy.

It is frequently in such cases of chronic ovaritis, in which there is so-called sclerosis of the capsule, and interstitial fibrous formation in the stroma of the ovary, leading rather to its contraction and atrophy than to hypertrophy, that we find the most severe pain present. In many instances the antecedent ovaritis has led to necrosis, with consequent multiple abscesses, and long before the fusion of such may lead to a pus cyst, the pain resulting from the suppurative ovaritis must be intense. It is not necessary that there need be any tangible enlargement of an ovary, in which follicular degeneration, associated with thickening of the albuginea and recurrent localised attacks of peritonitis, have occurred; and, save by tenderness on palpation through the vagina, and getting the ovary between the fingers in the bimanual method, digital exploration reveals nothing very abnormal. Yet it is often in such instances that dyspareunia, erratic pelvic pains, neuralgia, difficulty in walking, with that heterogeneous group of symptoms to which we give the name of "neurotic" or "hysterical," occur. In the early stages of hæmatocystic, hydrocystic, and colloid degeneration of the ovary, there may be little enlargement, and yet excessive pain. The point I wish to emphasise is, that pain, in affections of the adnexa, as of the uterus, is a symptom which is most deceptive, both in diagnosis and prognosis. Certainly some of those who have had the most acute ovarian suffering that I have known, have had the least pathological changes in the ovaries and tubes, either discoverable before or ascertained after this removal. The knowledge of this fact does not influence our judgment in testing the relative importance of the sensibility to pain, or the tendency to either exaggerate or minimise it, which we so often find in women of the neurasthenic type on the one hand, or the self-repressive on the other. Contrast such pain as that to which I have referred in the case I have mentioned, with the statement of a patient, an apparently robust woman in all other respects, from whom the pus tubes and sacs shown in Plate IV. were removed.[1] Her only complaint was incontinence of urine, for which she had consulted a surgeon, who, finding pelvic evidences of pressure on the bladder, sent her to me. When she came, the distended bladder reached to the umbilicus, and I drew from it 5 pints of urine. The enlarged uterus was pushed out of the pelvis, which was filled by a hard and unyielding mass,—so hard, that my first impression, fortified by the history of the case, was that I was dealing with a uterine fibroma, nor was it until after some days' observation that I determined that it was a huge infiltration which filled the pelvis and surrounded the uterus. The kidneys in this case secreted, before operation, from 8 to 9 pints of urine in the twenty-four hours. The uterus and ovaries were found imbedded in the old exudation, a mass of adhesions binding everywhere together the uterus, tubes, and ovaries (Plate IV.). She is a perfectly sound and healthy woman to-day, three years after her operation. Such a case as this is illustrative, not only of the extent to which disease may proceed in a woman without causing, as she repeatedly assured me, "any pain whatever to speak of," but it is an exemplification of a condition of things often most difficult to differentiate and decide upon. In cases of old hard infiltrations, in which there may be enlargement of the uterus, with or without myomatous changes, and where the entire mass is fixed by adhesions and inseparable from the uterus, diagnosis is most difficult; and I have myself been deceived in another case of a somewhat similar nature to the above, believing that I was really dealing with a fibromatous uterus.

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[1] *Trans. Obst. Soc. London*, 1897, p. 319.

Recurring to my reference to subjective and reflected phenomena, arising out of disease of the generative organs, one cannot help feeling that a danger arises to all of us from the habit of concentration of attention on these, and thus we are prone to overlook or to minimise symptoms the presence of which necessitates careful examination of other viscera and organs. This applies, whether we are or are not able to discover some morbid condition in the pelvis. The mischief which has been wrought by a neglected retroversion, a protracted endometritis with a deep and increasing erosion, or some progressive ovarian degeneration, is not necessarily removed because we readjust the uterus, cure the uterine lesions, remove or resect the ovary. And we may have to determine how far a retinal lesion, a unilateral exophthalmos, oculomotor disturbance, disorder of innervation, or ocular neuralgia, may be attendant upon, or the consequence of, such pelvic conditions. The same remark applies to cranial neuralgias, various forms of migraine, paretic and hysterical aphonia, tinnitus aurium, and many other reflex neuroses, associated or not with physical changes in the organs affected. Nor, indeed, do these observations bear on the effects due to affections of the pelvic viscera alone. We need only refer to the number of direct and reflected disturbances which a movable and enlarged kidney will excite, to realise how we are inclined to seek elsewhere for the cause of symptoms which at first sight appear to have but little connection with an unsuspected organ. Indeed, in regard to movable kidney, it is the first suspicious factor that, in examination of the abdomen for any abdomino-pelvic affection, we should look for. Its occurrence is so frequent, the variety of effect following its presence so great, and the serious nature of the renal changes often found associated with it so considerable, that any chance of its being overlooked should be a first consideration. This becomes the more necessary when we reflect that it is not uncommon in those cases in which there has been a general falling off in health, and reduction in fat due to disease of the pelvic viscera, when such loss of support brings about the mobility of the kidney. I have just performed nephrorrhaphy in a case in which a short time since the adnexa were removed. I have fully recorded the particulars of a case in which metritic changes and endometritis complicated the presence of a large movable kidney, where the persistent elevation of temperature could not be accounted for, inasmuch as the uterine conditions were relieved, and yet the hyperpyrexia remained.[1] The operation of nephrectomy disclosed a carcinomatous kidney, and the nightly pyrexial range appears to have been due to the inflammatory changes occurring in or around the capsule. There were no indications of any purulent deposits anywhere. It is equally unfortunate to overlook some affection of the uterine organs, having discovered the renal displacement, as it is to fall into the opposite error. I recently saw a patient, sent to me as suffering from an enlarged and retroverted uterus, in whom I found a freely movable kidney, to which, as much as to her retroversion, I attributed her general symptoms.

We must not forget, however, that we are liable to mistake other tumours or swellings for mobile kidneys. Thornton and Greig Smith pointed out the difficulty of diagnosis which might arise in certain cases of distended gall bladder and pyloric tumour. I have mistaken, in the first instance, a hard accumulation in the hepatic flexure of the colon for the renal displacement, and we know that a wandering kidney, which may have been at the same time enlarged and fluctuating, has been mistaken for ovarian cystoma, pedunculated fibroid, hydrosalpinx and pyosalpinx. In one case of mine, the supposed enlarged kidney, the edge of which could be felt closely simulating the margin of the spleen rather than that of the kidney, proved to be a completely displaced liver (hepatoptosis).[2] The patient, who had some time before been almost *in extremis* from hæmatemesis, had been treated for gastritis and gastric ulcer. On abdominal exploration, I found the liver lying completely at the right side, the gall bladder displaced from its position, the free margin of the liver lying forwards, the organ being healthy, but congested, and reaching to the right inguinal region. The abdominal viscera being carefully examined, and the liver replaced in its position, the abdomen was closed, with the curious but pleasing result that since the operation the patient has been in excellent health. That renal cystic tumours, hydronephritic and pyo-nephritic enlargements have often been mistaken for ovarian tumours, or solid tumours of the ovary, is well known. One such case I have seen in which a large perinephritic abscess was thought to be an ovarian cyst. Aspiration in the renal region decided its nature. In speaking of genito-urinary complications, perhaps the most difficult of all that the gynæcologist has to differentiate are those in which he has to decide if the genito-urinary symptoms and signs are caused by coexisting adnexal

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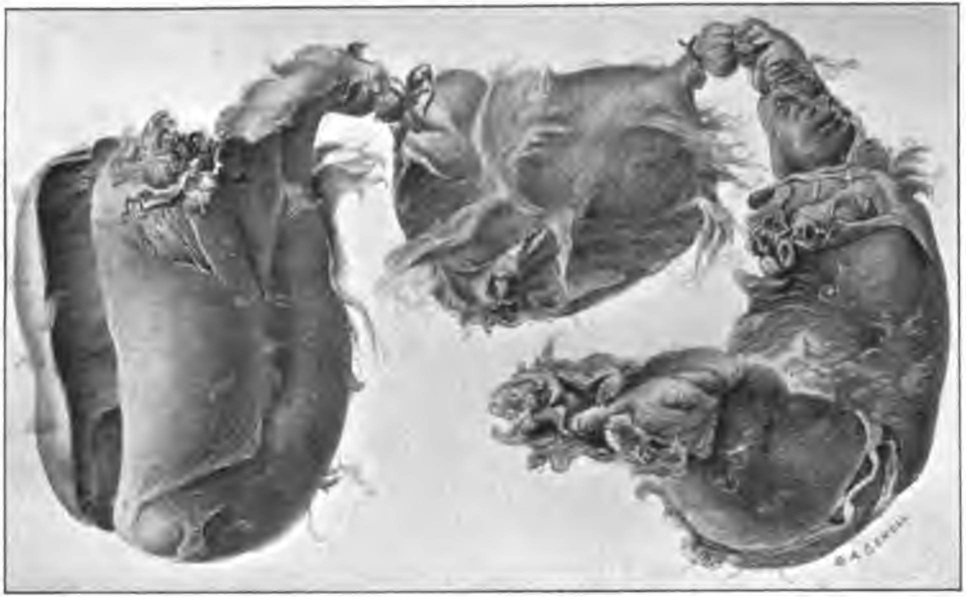
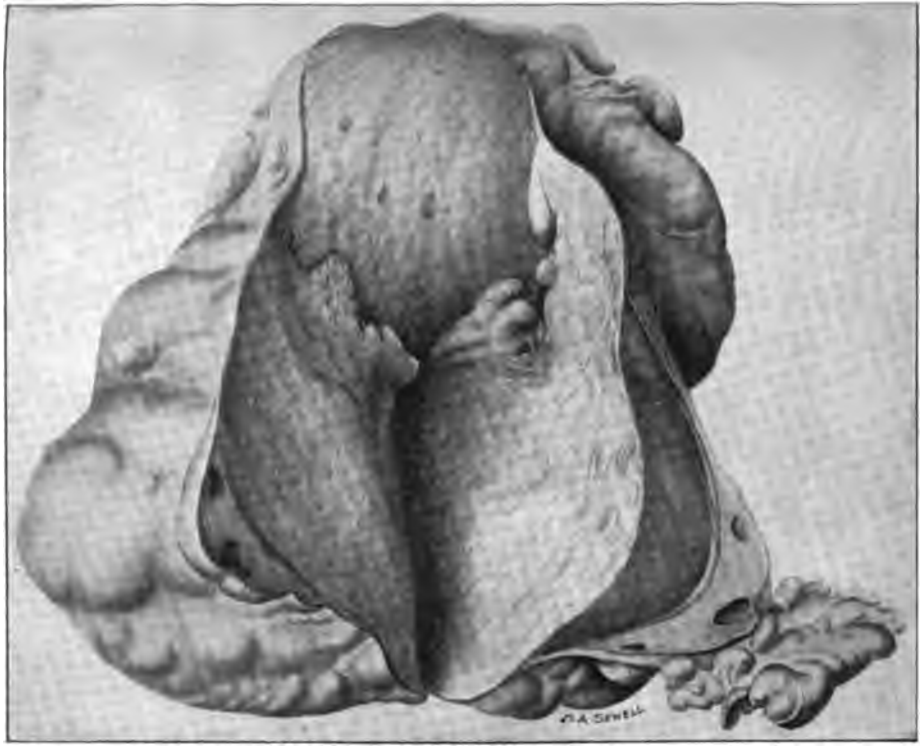
[1] *Brit. Gynæc. Journ.*, London, August 1897.
[2] *Trans. Med. Soc. London*, 1898, vol. xxi.



DOUBLE PYO-SALPINX.

Salpingo-oophoro-supra-vaginal hysterectomy—showing the pus tubes and large ovarian sacs—the left ruptured in removal, the right removed without rupture. The uterus and ovaries were imbedded in a dense and hard infiltration filling the pelvis. The patient made an excellent and permanent recovery.



Cysto-sarcoma of the left Ovary.

The sarcomatous growth filled the pelvis, pushing the uterus out of it to the right. When seen and diagnosed as myoma of the uterus, the degeneration converting a portion of the tumour into a cyst had not occurred; ascites followed. The cyst was tapped and the mass removed. Up to the present the recovery has been uninterrupted.

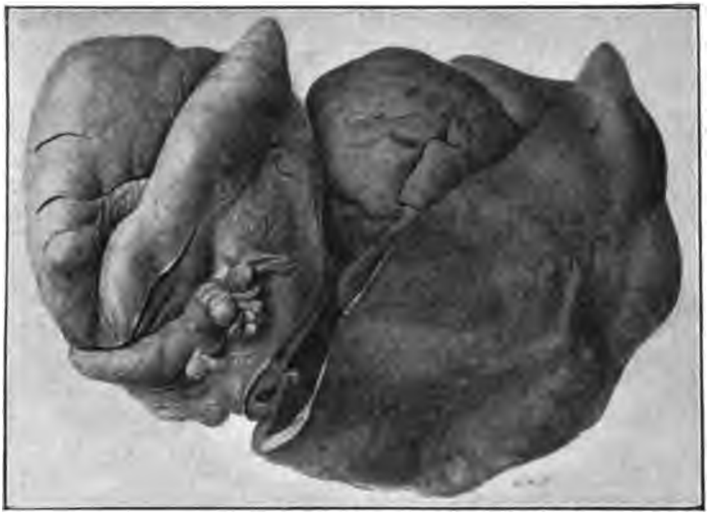


FIG. 1.

Solid adenoma of the ovary with cystoma mistaken for pregnancy. Removed after a severe attack of general peritonitis followed by ascites; rapid and permanent recovery.

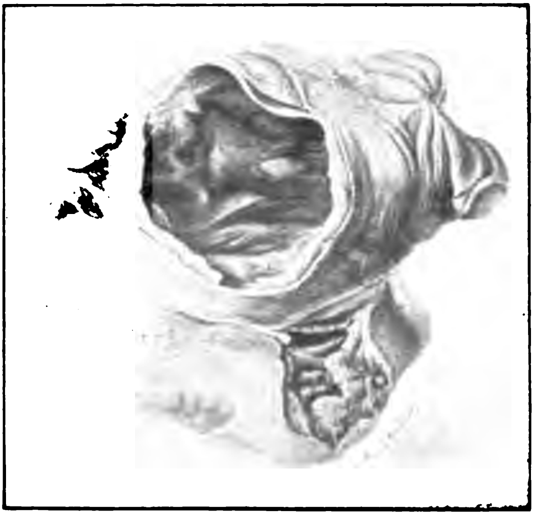
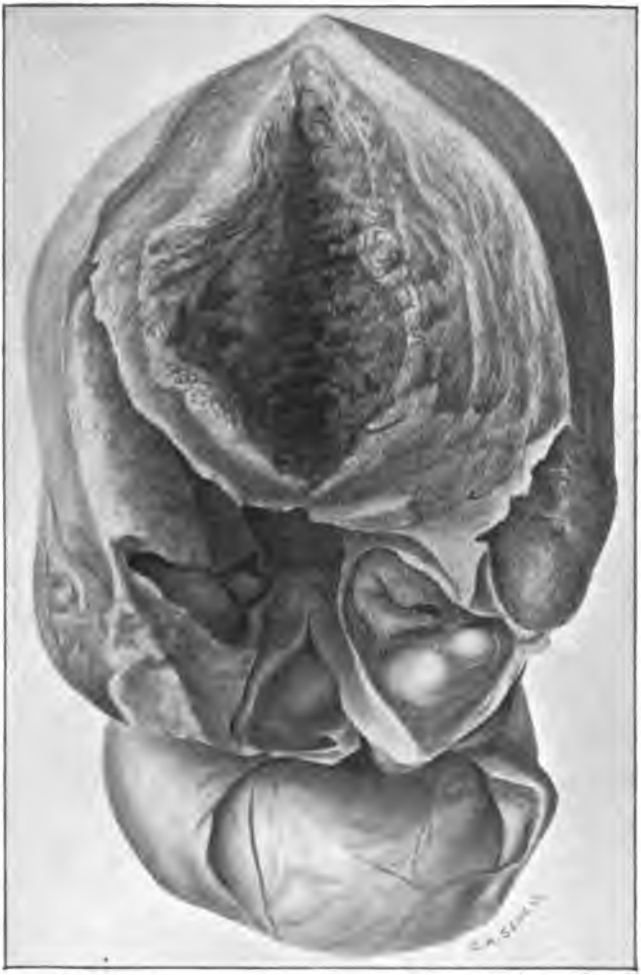


FIG. 2.

Cyst of meso-metrium, simulating early ectopic gestation. Removed by colpotomy. Recovery.



Dual Myoma of the Uterus.

There were no urgent symptoms. The patient was otherwise in good health, but the tumour was perceptibly increasing in size. Operation was decided upon, and supra-vaginal hysterectomy performed. On section, a considerable necrotic area was found in the upper myoma, and the canal of the uterus greatly enlarged and full of mucoid fluid.

disease, involving either the ureters or bladder, or have arisen independently of these. Fortunately the occasions are rare in which suppurating adnexal tumours, tubercular or other, involve the ureters, but such a complication has to be borne in mind. The absence of any evidence of renal enlargement, or disease by palpation, the presence of pus in the urine, and the coexistence of an adnexal tumour, will help us to a decision. Remembering the possibility of tuberculous infection passing thus to the ureter and bladder, indicates the importance of an early bacteriological examination in these cases. It is in this class of affection that Howard Kelly's methods of exploration of the bladder, ureters, and kidney, by direct inspection and catheterisation, are of such great value.

There are two conditions that may complicate the presence of an abdominal tumour, and which considerably increase the difficulty of diagnosis,—the presence of ascites or pregnancy. There are few with any experience in abdominal and pelvic surgery who have not realised this. I recollect my second case of ovariotomy, in which there was considerable difference of opinion amongst my colleagues as to the presence of an ovarian tumour, but no doubt as to that of ascites. The abdomen was greatly distended with the ascitic fluid, and I was able to disassociate the uterus, which was of natural size, in a nullipara, æt. 20. I had the fluid examined at the time, and some of Drysdale's granular cells were detected. After careful examination, from the negative evidence, in the absence of all signs of organic disease, and the history of the case, together with a careful physical examination, I came to the conclusion that it was ovarian cystoma. On making the preliminary incision, I was disagreeably surprised to find that it was a large quantity of ascitic fluid that escaped from the peritoneal cavity which I had opened. Turning the patient on her side, I drained off the fluid, and was relieved by the discovery of a large polycystic colloid ovarian cystoma, which had ruptured in several places, and had evidently caused the ascites. But my experience was a very unpleasant one before I discovered the tumour. This was the case I referred to in my previous paper in this Journal.[1]

Quite recently I showed at the Gynæcological Society an ovarian cysto-sarcoma, which I had diagnosed as a myoma of the uterus. The patient consulted me at the latter end of 1899, being sent to me for a myomatous tumour requiring operation. Examination revealed a hard mass filling the pelvis, the uterine cervix being felt above and to the left side, and giving the usual feeling found with myoma. I did not at the time, by bimanual examination, detect any fluid. Not seeing her again until she was on the table for operation, some three months subsequently, I was surprised to find, when she was under the anæsthetic, that there was evidently fluid in the peritoneum, and also that I could detect fluctuation in the upper part of the tumour. I then thought I had to deal with a fibrocyst of the uterus, and that there was some accompanying ascites. The tumour proved to be a cysto-sarcoma of the ovary, the solid portion completely filling the pelvis, and the upper part enlarged, which had, as reported by Mr. Targett, who examined the specimen, softened into a cyst with fluid contents. The patient made an excellent recovery, and so far has done well (see Plate V.).

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[1] *Edin. Med. Journ.*, 1900, vol. vii. p. 413.

Many years have passed since I saw in a Metropolitan hospital, when ovariotomy attracted more spectators than it has done of late years, an operation commenced for ovarian cystoma, and interrupted because it was not possible to proceed with a large hydatid cyst of the liver. And in connection with this reminiscence, I recall a case in which a large semisolid multilocular, ovarian cystoma filling the abdomen, the solid upper portion of which could not be dissociated from the spleen and liver, caused me considerable anxiety both in diagnosis and operation. In a case in which a rather magical cure was attributed to me, a difference of opinion between a distinguished general physician and obstetrician had occurred as to the nature of an abdominal swelling. The one considered it to be ovarian, and the other ascitic. As a consequence, tapping was recommended. This was carried out, and again the fluid accumulated. On seeing the patient, I came to the conclusion that the tumour was not ovarian, and advised that the fluid should be again drawn off, and at the time a careful abdominal exploration made. This was done, and I saw the case the following day. On examination, I found rather a hard mass in the neighbourhood of the lobus Spigelii. I determined to explore this, and, after making a small incision over its site, I passed a rather large-sized aspirating needle well into the mass, so as to test its nature. Nothing returned save blood, and I was afraid that the growth would prove to be malignant. The result of the experiment was, that this mass shrank, there was no recurrence of effusion, the lady married, and has children.

I have referred to pregnancy. The many obstetric complications that may arise during its course, and which may or may not be detected before parturition, are familiar enough to us all. Yet, realising this as we do, we are still liable to overlook them, and to experience considerable difficulty in differentiating and isolating them. It may seem impossible that a modern gynæcologist would mistake a myomatous for a pregnant uterus, yet few of us, I think, but know cases in which this error has been fallen into, and that by men who have had no inconsiderable work among such tumours. Of course it is in those cases in which the myoma complicates pregnancy that an error is most liable to be made, and this oversight may occur at any stage of the pregnancy, whether in the earlier months, when we may be confronted with small interstitial myomata in the lower zone of the uterus, or later on, should miscarriage not occur, when the myoma has increased in size with the pregnant uterus, and is situated in the upper or middle zone of the fundus. Small intramural myomata, when complicating early pregnancy, escape detection, attention being concentrated on the signs and symptoms of pregnancy at this stage; but there is the possibility of such a tumour being attended by the same symptoms in the absence of pregnancy. By the appearance of the catamenia or the occurrence of irregular losses, the presence of erratic pains and uterine contractions, through the rapid growth of the tumour and the absence of the usual alterations found in the cervix which are consequent upon a fibromatous growth, by the pulsations transmitted to the ear through the tumour, and which may simulate the fœtal pulsations of pregnancy, by the presence of a cyst in the tumour, giving to it the more elastic feel of the pregnant uterus, and by the complications of ascites and œdema,—by these and other misleading signs, is a myoma likely to be mistaken for the pregnant uterus, or the complication of pregnancy and myoma overlooked. More nearly concerning obstetricians, are the difficulties which have deceived some of the most experienced, where, at the time of labour, a myoma has been mistaken for an ovarian tumour, a growth of any kind originating in the pelvic wall, a fæcal tumour, and even placenta prævia.

Perhaps no form of pelvic disease opens so many possibilities of error to both physician and surgeon as ovarian cystoma. Even assuming that we are correct in our differentiation of a true ovarian cyst, apart from a simple cyst of the parovarian, we have in our preliminary examination to decide as to its nature, whether unilocular or multilocular, whether benign or malignant. This assumption, however, removes at once some fifty or more abdominal conditions, each of which so far simulated ovarian cystoma as to have led to operative errors as a consequence. There are the more frequently occurring complications to be determined,—ascites, pregnancy, ectopic gestation, cystic or other disease in the kidney, spleen, or liver, uterine myoma, suppuration in the cyst, and extensive adhesions.

Pregnancy, associated with more or less hydramnios, has probably been the most frequent of these conditions to act as a pitfall for the gynæcologist; and those forms of cystoma which give rise to ascitic accumulation are amongst the most difficult to determine, when the ovarian disease has attending it some of the signs, negative or otherwise, of pregnancy.[1] I have recorded an interesting case, in which a practitioner was called in to attend a patient in labour, the pains having, as she thought, begun, though in reality it was but the commencement of a severe attack of peritonitis, which ran a most serious course. A large tumour was found inclining towards the left side, and a rapid ascitic distension followed. Her life was in extreme danger for some days. I operated just one month after the onset of her attack, removing the tumour shown in the Plate, extensive adhesions, both of the sac wall and of the intestine, having to be separated. The peritonitis was due to considerable twisting of the pedicle, and the tumour proved to be a multilocular adenoma of the ovary (Plate VI, Fig. 1).

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[1] *Brit. Gynæc. Journ.*, London, August 1898.

To show the importance of discarding previous impressions in approaching a case, I may record one in which I myself narrowly escaped the consequences of too rapid an examination. I was asked by two medical men to see an abdominal case, supposed to be ovarian, with a view to operation. The patient was over 40 years of age, her last pregnancy having occurred twelve years previously. The catamenia had been irregular for some time, but had ceased for a few months before my seeing her. Her general health had suffered, and distress both with regard to micturition and defæcation had increased. The abdominal tumour had grown in size, and no suspicion of pregnancy was entertained. Seeing the case a day or so before operating, and prejudging from the description I had been given, I made too cursory an examination of the abdomen, and on examining per vaginam found a cervix which conveyed no impression of pregnancy. On examining through the posterior fornix, I found fluctuation and a solid mass, and remarked that the *ballottement* I felt must be due to a solid intracystic tumour, suggesting to the medical advisers that they should feel for themselves how closely the *ballottement* of pregnancy was simulated. Preparations were made for operation, and I did not see the patient again until she was under the anæsthetic and the abdomen prepared. Immediately I was struck with its appearance, asked for a stethoscope, and satisfied myself as to the fœtal pulsations and the presence of the mammary secretion. I was enabled to congratulate the anxious husband, who came to hear the result of the operation, on the unexpected happiness that awaited him.

Such a mishap teaches us in diagnosis the value of the axiom, "Take nothing for granted or on hearsay." It has always to be remembered that in the case of abdominal swellings and pelvic effusions or collections of fluid, the conditions are often transitory, and signs which are clear and unmistakable when an examination is made, may not be present even after a comparatively short time has elapsed. Thus the most painstaking medical man may find himself confronted with a completely altered state of things when the patient comes for further advice, should no examination have been made in the interval. Serous cysts rupture and are absorbed, collections of blood disappear, effusions and exudations which may have been hard and extensive, soften and become purulent, or are reduced in size, so that but slight evidences of their occurrence remain; cysts sometimes grow rapidly, and assume unexpected proportions; displacements, adhesions, and fixations also occur, either as consequences of any of these pathological conditions or changes, or as fresh complications. All this is true of the adnexa. In the uterus, small interstitial myomata both appear and grow rapidly. Recent adhesions will alter its position, as will effusions, and, as in a case I intend to quote, even the emptying of the bowel and bladder prior to an examination may reveal a small pelvic tumour not discoverable beforehand. Cervical erosions take often but a short time in making their appearance, and what is an erosion to-day may after a few months have assumed the character of the pre-cancerous stage. What we are doubtful of as malignant to-day, we may not hesitate to pronounce so in a few months. An erosion and follicular degeneration with an endometritic discharge will frequently escape detection by digital touch, but would be revealed by a proper examination by the speculum. More particularly have we to be careful of any influence on our exercise of caution by the statement or history of a patient. Take, for example, the case of a wealthy patient consulting me in order to support proceedings for nullity of marriage on the ground of impotence. *The hymen was intact*, she was in perfect health, and most nervous lest I should injure her in any way by examination. The accident of placing my hand over the pubes saved me from an awkward blunder. I proceeded to carefully investigate her condition, and satisfied myself that she was pregnant,—a conclusion which she continued to indignantly deny the possibility of, as long as the outward manifestation permitted her to do so. Mentioning the case induces me to emphasise the known fact, that an intact "folding" hymen is compatible with the birth of a child at full term, and consequently must only be taken as evidence *inter alia* of the "*virgo intacta*" state.

Speaking of the sudden appearance or disappearance of tumours, it is not necessary that they should be "phantom" tumours for this to occur. Only recently, I was sent a patient with a considerable swelling in the right lumbar region. I found a large mobile kidney, with hydronephrosis. I explained the position to the patient, and wrote my view to her medical attendant. She went home, and within a few days, while making up her mind as to interference, the swelling began to disappear, and when I saw her shortly after there was nothing save an ordinary and not very mobile kidney to be detected. This, of course, is not an uncommon occurrence, and is easily explained by some temporary ureteral blocking, but, as in a case which happened before, may shake a patient's confidence in one's opinion.

I removed a polypus from a lady who thought she was pregnant. On seeing her, I discovered the polypus slightly protruding from the os uteri. The following day, under ether, I proceeded to remove it, and could detect no growth. Examining the uterus with a sound, I failed to detect anything in its cavity, and came to the conclusion that, as sometimes occurs, the polypus had been extruded with uterine pains, and that its pedicle had given away. A few days subsequently she again visited me, complaining of the same symptoms. The following day I dilated the cervix, and removed a pear-shaped polypus with a long pedicle which was attached to the fundus, and which must have retracted under the anæsthetic, the sound in exploration passing round it.

At the Gynæcological Society I showed a pedunculated submucous fibroid, removed from a uterus that had not long before been curetted by an obstetric physician. Hæmorrhage, pain, and considerable anæmia continuing, I saw the case; and, on dilatation of the uterus, determining to explore and re-curette if necessary, I found the polypus within reach of my finger, and removed it. The curette had been carried round the pedicle of the polypus.[1]

I once lost the confidence of a patient through failing to realise that a persistent pain in the gluteal region and thigh was due to the pressure of a not very large myomatous uterus. The lady was subject to gout and rheumatism, to which I attributed the pain. I showed at the Obstetrical Society a fibromatous uterus and adenomatous ovary removed from the same patient. The pain in the hip and lameness had been the only symptoms complained of, and had absorbed the attention of the medical adviser, and for these she consulted me. I discovered the fibroma, but did not realise the condition of the ovary until operation, when it was found to be the size of an orange and jammed down into the pelvis at the left side. The symptoms completely disappeared after operation.[2]

A few years since, I exhibited a pure fibroma of the ovary, removed from a young patient who had for some time been suffering from anæmia and amenorrhœa with persistent sickness. After a careful abdominal examination, I discovered nothing to explain the symptoms, and advised a Weir Mitchell course. A few days subsequent to this, I discovered to my surprise a small movable tumour in the left inguinal region. Placing her under an anæsthetic the next day, the bladder and bowel having been emptied, I found that the tumour had quite disappeared from its position, and now lay in the pelvis in front of the uterus, requiring a vaginal examination for its recognition and isolation. In the ascent of the full bladder, the tumour had been raised above the pelvic brim.

I have not alluded to another not uncommon yet most serious error,—that of mistaking the earlier symptoms of appendicitis for inflammation of the adnexa and pelvic peritonitis. I have seen some fatal errors arising from this mistake, with the consequence that perforation occurred from a fulminating appendicitis before any operation was proposed. At the same time it is well to bear in mind the possible occurrence of some form of ovaritis or salpingitis, side by side with the appendical inflammation.

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[1] I shall again refer to undetected intra-uterine polypus as a cause of aggravated dysmenorrhœa.

[2] *Trans. Obst. Soc. London*, vol. xl. p. 154.

Perhaps no pathological change reaches such an advanced stage without discovery, as malignant disease of the uterus. This may be due either to neglect in making a careful examination, as the disease is not necessarily attended by pain, and the other characteristic symptoms of cancer, or to the malignant changes gradually taking place in that which has been previously looked upon as a benign growth. It is not uncommon to find an advanced carcinomatous cervix discovered for the first time through the hæmorrhage which it causes, while malignant disease of the body of the uterus can often only be determined after dilatation, and removal of portions of the tissue for examination. Our increased knowledge of the pathology of the adnexa has proved how much more frequently than was supposed, morbid changes in the ovaries and tubes are either of a carcinomatous, sarcomatous, or papillomatous nature, while endotheliomatous and gyromatous changes, undiscoverable before operation, are occasionally found.

To illustrate the impossibility of arriving at a complete diagnosis, even in such an apparently simple case as a uterine myoma, I may refer to a tumour recently removed by me, in which I gave an opinion for operation, in consequence of the increasing size of the tumour, though the patient's general health was not affected in any marked degree. The operation had been pronounced as one not of absolute necessity. On operating, the growth was found to consist of two distinct tumours, but intimately connected. The upper contained the uterus, the lower solid mass filled the pelvis. In the centre of the former was a large bed of necrosed and degenerating tissue, surrounded by a zone of calcareous tissue, to be discovered only by section of the growth. The uterine cavity was filled with mucoid discharge, and was greatly dilated, as were also the Fallopian orifices. The condition is well shown in Plate VII. Death from septicæmia or other consequences of the necrotic change must have been the result in such a case, had the tumour not been removed.

I have not included in this comparatively brief summary of our gynæcological pitfalls, those into which we are liable to be led by ectopic gestation occurring at any time during pregnancy. These every surgeon is familiar with. I operated quite recently in a case in which I had no certainty from the symptoms as between a hydrosalpinx, pyosalpinx, or ectopic gestation. The fluctuating tumour I felt posterior to and behind the uterus almost filled the space of Douglas. By colpotomy I found the right ovary enlarged and cystic, the Fallopian tube crossing the space, and the cyst principally at the left side. Examination proved that it was none of the conditions that I suspected, but a cyst of the mesosalpinx (Plate VI., Fig. 2).

The few instances that I have here given of the dangers that beset us in making a diagnosis, establish the need there is for extreme care in the first examination of a case. It must, however, be admitted that if, as is absolutely necessary in a large proportion of cases, anæsthesia be availed of, and the bimanual method of examination, by the vagina and rectum, in the dorsal position, be adopted, the rectum and bladder having been previously emptied, most risks of blundering will be avoided. Such an examination includes the judicious use of the sound,—though resort to it is less necessary when the finger becomes more educated and those precautions I have referred to have been taken. But no matter how exhaustive be our inquiry into the antecedents and history of a case, or how searching be the investigation of the abdominal and pelvic viscera, there still remains a balance of conditions, the nature of which can only be ascertained by abdominal exploration or colpotomy.

CLINICAL RECORDS.

CASE OF CEREBRO-SPINAL FEVER—PURPURIC VARIETY.

By WILLIAM FREW, M.D., *Physician, Kilmarnock Infirmary.*

ON several previous occasions I have drawn the attention of the profession to the occurrence of this disease in Scotland, and have no doubt but that, were its members made more familiar with the signs and symptoms of it, many more cases would be recognised. Lately in this district I have seen several well-marked cases. Of these, three were seen in consultation with professional brethren, who had recognised their true nature before I was called in, and the others have occurred in my own practice. The latest of these having exhibited the features of the disease in its most malignant form, I have thought it desirable to place it on record.

The victim was a healthy girl of 8 years and 4 months, who had not suffered from any of the usual diseases of childhood, and never had any ear trouble. On the morning of Thursday, 8th March, she was found in bed extremely ill. I saw her at once, and was much struck with her appearance. She was tossing about uneasily, and moaning loudly as if in great distress. She had a dazed and stupid look, and although she evidently heard and comprehended to a slight extent what was said to her, she was quite unable to give any verbal answer. Her face exhibited a deathly pallor, but somewhat livid; the eyes were sunk and vacant-looking when opened, the extremities cold, the pulse thin, very rapid and weak, and her breath had a peculiar fœtor. But what above all added ghastliness to her appearance, was a copious purpuric eruption over the face, legs, and arms,—a very few spots only occurring on the trunk. The spots were chiefly pinhead in size, but here and there a few had coalesced and formed distinct patches. Spots were noticed on the conjunctivæ and gums. She had been vomiting into a basin which had been set on a chair at the bedside; and although there was nothing that could be termed a hæmatemesis, some of the contents looked dark, like coffee grounds. It was observed that she had passed her urine in bed.

In the serious condition which she was evidently in, I judged that the first thing to be done was to endeavour to relieve her suffering, and at the same time arrest the vomiting, and for this purpose I gave her immediately a suitable dose of morphine and atropine hypodermically, which had a rapid and good effect. Hot bottles were placed around her, and a large mustard and linseed meal poultice applied over the chest and abdomen. As soon as possible also an enema of peptonised milk, with a small dose of brandy, was administered by the rectum and retained. After the lapse of two hours or so I had the satisfaction of seeing the child resting quietly, with the pulse greatly improved, and no recurrence of the vomiting. The temperature, which had meantime been taken in the rectum, was 104°.

Having had time to inquire into the previous history of the case, I found that she had been confined to the house since Monday the 5th inst., when I saw her with slight sore throat and a temperature of 101°, and concluded that she was suffering from a mild attack of influenza, which was prevailing at the time. Next day she was much better, and was out of bed in the afternoon. On the morning of the 7th she seemed quite well, but her mother judged it advisable not to send her to school, the day being very cold. Towards the afternoon, her mother, noticing that she was not looking so well, and had refused to eat her dinner because she felt sick, advised her to go to bed, which she did. Some little time after, she vomited, and put up the remains of an orange which she had eaten in the earlier part of the day, and to which her sickness was attributed. Later in the evening she was again sick, but at 11 P.M. was apparently sleeping quietly with an elder sister beside her. Nothing further was known of her until 7.30 of the following morning, when she was found in the condition I have described.

Here, then, we had a child of 8, found practically in a collapsed and dying condition, with a temperature in the rectum of 104°, with persistent vomiting, a very clouded condition of the brain, and covered with a copious purpuric rash. The question of diagnosis was not an easy one to answer, for the condition of collapse into which she had so quickly passed obscured, or in fact arrested all the other symptoms. Once before only in my experience had I seen a girl of about the same age die in a night's illness with a purpuric rash of a similar kind, accompanied by vomiting and diarrhœa, and where a post-mortem examination, ordered by the authorities at my solicitation, revealed it to be a case of cerebro-spinal fever;[1] but although this case flashed into my mind, I dismissed the suggestion as being too unlikely, and waited in the hope that time would throw further light upon it.

During the day the child continued to improve slowly, and by the evening had rallied considerably. There was not a corresponding improvement, however, in the brain symptoms, the condition being still one of stupor. In the evening, Dr. Finlayson from Glasgow saw her with me, and, after a careful consideration of the whole case, we inclined to the view that it was a case of purpura hæmorrhagica, with probably extravasations on the brain. The temperature taken in the rectum was now 101°, and generally her symptoms were better. Still any attempt to give nourishment by the mouth brought on the vomiting. We therefore continued to feed entirely by the rectum, and to give the medicines hypodermically. These latter consisted chiefly of morphine and atropine, with twice a small dose of strychnine.

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[1] See paper in *Glasgow Med. Journ.*, July 1884.

During the night improvement continued slowly, and on the morning of the 9th the temperature was normal and the pulse fairly good. The brain, however, was still clouded, and she had some delirium of a rambling, childish kind. This improvement was maintained during the day, and she became decidedly more conscious. At one time she complained of pains in her legs, and moving her in any way seemed to cause her more suffering. She lay with the face turned upwards, and the eyes mostly open, and any attempt to bend the head forwards was manifestly very painful. Nothing, however, was retained on the stomach. The bowels moved freely of their own accord, and urine was passed in bed. In the evening the temperature began to rise again, and coincidently the moaning and restless symptoms returned. During the night small doses of morphine had to be given frequently to procure rest. The head became more firmly retracted, and curving of the spine was very marked. At times the body formed quite a crescent, the feet and the head being approximated. The hands and arms were in perpetual movement over the head, face, and neck, sometimes leaving the marks of her nails in the flesh. At 8 A.M. on the morning of the 10th the temperature had risen to 103°. The pulse varied much, at one time rapid, at another slow. The face and neck flushed remarkably at intervals, and at these times the breathing was accelerated and loud. She was now completely unconscious, but in her delirium still rambled on with her childish prattle. I had now become perfectly convinced as to the nature of her illness, and saw that it was running a rapidly fatal course. Dr. Finlayson saw her again with me about midday, and inclined to confirm my own opinion. The temperature in the rectum was now 106°. There was much twitching of the muscles of the arms and legs, and coma vigil was very marked. The end was rapidly approaching, and she died at 2.15 same day. No post-mortem was made.

No one who has read descriptions of this disease as it occurs in other countries, and notably in the United States, can have any doubt about its nature. Had the child died, as she might have done, in the state of collapse in which she was when discovered on the morning of the 8th, there might have been much doubt as to the cause. The course of the disease had been arrested by the collapse, but as soon as the child recovered strength in some measure, the disease resumed its course and revealed its true nature. The similar case which I saw in 1884 and have related in the paper which I then read before the Clinical and Pathological Society in Glasgow, died in a state of collapse, after an illness of only one night's duration. Unfortunately she had died before I reached the house, and it was only because I was seeing other cases of the disease in the district at the time that I suspected it might be such, and succeeded in getting a post-mortem examination, which confirmed my suspicions.

There may, however, be equally rapid and fatal cases without rash of any kind appearing. Three or four months ago I was called at 2 A.M. to see a boy of 10 who had been seized with convulsions. He had been sent home from school the previous afternoon on account of headache and vomiting; some medicine was administered by his mother, and he was put to bed. Nothing of note occurred until he was found in convulsions, and although I did what I could to try and arrest the disease, nothing proved of any avail, and he died at 11 A.M. of the same day. No post-mortem was made, but in view of the cases I have seen since, I think it was quite likely a case of malignant cerebro-spinal fever, although no purpuric rash appeared.

Sometimes in less acute cases the diagnosis may get confirmation from the sequelæ which remain after recovery. Some time ago I was asked to see a case in consultation, where I had no hesitation, from the symptoms then apparent, of confirming the attendant's diagnosis. Additional confirmation was unfortunately obtained after the child's recovery, by the discovery that it had completely lost hearing, and, being only 6 years of age, it became dumb, and is now an inmate of a deaf and dumb institution. I related a similar case in the paper published in 1884.

For some years considerable scepticism existed in the minds of the profession in Scotland regarding the correctness of the diagnosis in some of the cases published, both by myself and Dr. Maclagan of Dundee.[1] I am glad to find that this is disappearing. Quite lately Dr. R. Bruce Low, Medical Inspector, Local Government Board, London, sent me a copy of a paper which he had read before the Epidemiological Society, drawing the attention of the Society to the incidence of the disease in this country, and to the diseases with which it is liable to be confounded.

Some members of the profession have written lately about a "simple posterior basic meningitis of infants," which may be mistaken for cerebro-spinal fever, but Professor Osler, who ought to have some experience of the disease, takes the opposite view, namely, that the mistake is on the other side, and quotes the fact that Dr. Still, an American pathologist, has in nine out of twelve cases of so-called posterior basic meningitis found a diplococcus corresponding closely to the *Diplococcus intracellularis* of Weichselbaum, which is now looked upon as the cause of the disease.

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[1] See *Edin. Med. Journ.*, 1886.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Introduction to the Outlines of the Principles of Differential Diagnosis, with Clinical Memoranda. By Fred. J. Smith, M.A., M.D., F.R.C.P. London: Macmillan & Co. Ltd. 1899.

No task is so difficult of accomplishment as the writing of a book which is to be a *multum in parvo,* and yet to have on it that stamp of originality in design and detail which make the writings of a teacher appeal to the mind of the student. The pathological training which Dr. Smith has enjoyed is fully utilised, and is evident in every page of the volume; while the freedom of speech, which is a distinguishing feature of the book, greatly adds to its teaching value.

It opens with some preliminary pages on diagnosis, and a useful chapter on micro-organisms and zymotic diseases. In the section on respiratory diseases, it is to be regretted that the author prefers to ignore the terms tympanitic and crack-pot in describing pulmonary vomicæ, and to indicate the quality of the note obtained on percussing the affected area in pneumothorax as hyper-resonant. Surely the term tympanitic is more applicable, except in these cases where the intrathoracic pressure becomes abnormally great, when it may become dull. Again, in distinguishing phthisis laryngea from syphilitic disease of the larynx, no reference is made to the characteristic appearance of the epiglottis in the two conditions, a point of recognised diagnostic value.

Dr. Smith deprecates Osler's views, that capillary bronchitis and broncho-pneumonia are one and the same disease, and in arguing that in the first we have the general affection of all bronchioles, and in the second a local spread of inflammation to the air vesicles, he seems to carry conviction to the mind of the unbiassed reader. In writing of the resistance experienced in percussing a pleural effusion, Dr. Smith states that it is experienced by the pleximeter finger, while he surely intends to refer to the plessor or hammer finger. An admirable diagnostic account of intrathoracic tumours and aneurysms concludes the description of respiratory diseases.

Perhaps the author is most successful in his treatment of cardiac affections, commencing with a very necessary warning as to the evils attendant on the introduction of the stethoscope, with the consequent discovery of bruits, which may be of little or no importance either to the physician or the patient. The diagnostic value of cardiac percussion, and the success claimed by the exponents of the Nauheim treatment, as demonstrated by such percussion, meet with scant courtesy; still it is an open question whether the right border of the heart is not worth defining, or attempting to define, in many cases where backward pressure is present, even although emphysema adds to the difficulties of the operation.

Some interesting statements are made as to the significance of murmurs, as indicating the extent of organic heart disease fully, partially, or insufficiently. These are based on an elaborate analysis of some 700 post-mortem examinations made some time ago. The author also states that mitral incapacity is the gravest single lesion, and aortic incompetence the most desirable. While we can readily agree in accepting the first statement, we must take exception to the second, which is hardly in accordance with the views of most physicians.

The section on abdominal diseases is clearly and forcibly written, but perhaps the advantages of the tabular method of teaching, which is the leading feature of the whole book, is best demonstrated in the chapter on urinary diseases: In discussing the various aspects of uric acid in health and disease, the author has devised the happy expedient of placing side by side acknowledged facts and theories which are still open to question. The reader is thus able in a few moments to grasp the details of an intricate subject by reading over an admirably planned tabular synopsis. Glycosuria is similarly treated, and in quite as successful a manner.

The author argues strongly in favour of "large white kidney" as a primary form of Bright's disease, basing his reasons for disassociating it from consecutive nephritis on pathological experience. The concluding sections relate to joint and nervous diseases; necessarily the latter is very considerably condensed, and a thoroughly practical chapter on urgency cases brings a good readable book of some 350 pages to a close.

A number of rather curiously sounding words occur here and there, which jar upon the sensitive ear, such as "clicky," "woodeny," "convected," "ureteral," and "pedicelled," but although their removal would be agreeable to many readers, they by no means spoil the usefulness of the volume.

R. A. Fleming.

Mammalian Anatomy: A Preparation for Human and Comparative Anatomy. Part I. "The Skeleton of the Cat." By Horace Jayne, M.D., Ph.D. London and Philadelphia: J. B. Lippincott Company. 1898.

In the words of a great biologist, the study of living bodies is "really one discipline." But it may well be doubted if a text-book which aims at a preparation for human anatomy by a most minute description of the skeleton of the cat, can be regarded as an example of judicious method, when so many exhaustive treatises on human osteology are already in use. To the training of the medical student a general outline of biology, of the fundamental phenomena of animal and vegetable life, is of course indispensable. The unity of natural science must be placed before him at the outset of his studies, and structure and function traced through different types to illustrate the characteristic organisation common to all. The proper pursuit of medicine is thus undertaken with a conception at once philosophic and practical. The human organism is invested with a new interest, arising out of all the relations suggested by variety in animal forms. But biology ought not to be presented in any other form than that of an introduction. The subjects of the medical curriculum afford ample scope for the study of structure and function in detail. The nature of the work and the mass of material demand all the energy and time of the student. Why he should be asked to anticipate the minute study which he is required to devote to "the bones," by a thorough investigation of osteological details in another mammalian form, we confess to be at a loss to understand. The salt of morphological ideas is scarcely to be found in so narrow a field. Nor is there any practical advantage to be gained. Difficulties of identification on account of the smaller parts, different relations of position, would enhance the labour of study without contributing proportionately to the stock of anatomical conceptions. The time and energy of the student would be expended without, in our view, any intelligible gain from such a digression into the sphere of mammalian zoology.

We cannot, therefore, agree with Professor Jayne on the usefulness of an exhaustive study of the cat as a preparation for human anatomy. But the author has also in view the needs of a wider circle. "The study of anatomy might be more generally encouraged and disseminated through our higher schools and colleges, and a student, even a very young student, boy or girl, working alone, perhaps at home, might be enabled to master unaided essential facts, without laboratory facilities, and remote from the repulsiveness of the dissecting-room." And again, "It is not unlikely, moreover, that there is many a one who, while desiring a general knowledge of human anatomy, is yet unable to attend a medical school. To such a student this volume is offered, in the assurance that the careful dissection of a typical mammal will be of more service than the reading of books and the examination of models." Does it meet the requirements of such students? The book contains 789 pages, is furnished with 611 illustrations, and is intended as the first of a series "which aims at presenting a more accurate and comprehensive description of the structure of a typical mammal than has been hitherto attempted." An introductory chapter deals with names, terms, and phrases. The systematic description of the skeleton is then taken up, and its parts are treated with the same detail we recognise as essential in human anatomy. At the end of each chapter is a careful comparison with the corresponding human bone. The wealth of illustration is unique. The engravings are throughout clear and good, and form a pleasing feature in the book. Some idea of the thorough treatment which the subject receives may be gauged from the section on the sphenoid, which occupies twenty-seven pages and is provided with twenty illustrations. The description of the teeth runs to fifty-five pages, which include a long section on the evolution of the mammalian forms. A big undertaking for the boy or girl student, we think! But to an advanced student of zoology about to specialise in mammalian anatomy the volume should prove decidedly helpful.

D. J. Coffey.

Nervous and Mental Diseases. By ARCHIBALD CHURCH, M.D., Chicago; and FREDERICK PETERSON, M.D., New York. With 305 Illustrations. London: Rebman Limited. 1899.

THE work before us proposes to be a text-book specially adapted to the wants of the medical student and general practitioner, and the authors have endeavoured, within the compass of some 800 pages, to traverse the vast fields of neurology and psychiatry with this object in view. In their preface the authors make the statement that, "in placing the correlated sciences of neurology and psychiatry under the same cover, the reader's convenience was considered," but it is very evident that the course thus adopted has proved fatal to a satisfactory treatment of mental diseases, owing to no fault of the author, but to the very inadequate space allotted to the subject of psychiatry. Dr. Church's section on neurology is not open to this criticism; an adequate space has been allowed for the discussion of nervous diseases, which embraces some 600 pages of the volume. He is particularly happy in the presentation of the subject, adhering to a simple and rational classification, condensing within reasonable limits an enormous mass of well-marshalled facts; his descriptions being both graphic and concise, he appeals strongly to the student of mental disease, whose interest cannot fail to be attracted and held by the style and lucidity of the author.

Part 1 deals with the examination of the patient, and provides the student with all the essential points to be kept in view in an inquiry into the healthy and diseased states of the nervous system. Part 2 deals with diseases of the cerebral membranes and cranial nerves. Part 3, with diseases of the brain proper, due regard being paid to the more recent conclusions arrived at on cerebral localisation. Part 4 treats of diseases of the spinal membranes and nerves, and the following section of the spinal cord proper. Part 6 is devoted to those affections of the general nervous system having a definite anatomical basis. Part 7, the longest section, is devoted to neuroses having no well-established anatomical basis, and is perhaps the most satisfactory division of the work. A short account is given finally in Part 8 of symptomatic diseases. Under syringomyelia, the diagnosis, we think, might have been further elaborated with advantage, and the *differentiæ* betwixt it and amyotrophic lateral sclerosis, tabes dorsalis, pachymeningitis, tumour of the cord, and progressive muscular atrophy appear too summarily dismissed. Under the description of acute ascending paralysis, the author attributes to the classical case recorded by Landry a paralysis "not marked by loss of sensation," whereas this case was specially one in which cutaneous sensibility *was* impaired; and although the pure motor implication without sensory anomalies is the more frequent condition, it would be unsafe to rely too exclusively on the negative states of sensibility for diagnostic purposes, as is done at page 347. The chapter on acute anterior poliomyelitis is an extremely clear exposition of this disease; its infectious origin and relationships to epidemic disease are strongly emphasised. The diagnosis, however, does not give Erb's paralysis as a possible source of confusion. Under progressive muscular atrophy it is not sufficiently indicated that, whilst the muscles show the reaction of degeneration to the constant current, the nerves react normally to faradic and galvanic stimulus, with a quantitative diminution of reaction only accompanying the progressive loss of muscular fibres. Nor is emphasis placed upon the *slow* response to the galvanic current, which in some cases is stated to be more characteristic than the anodal closure increase.

It does not appear satisfactory, from the student's point of view, that chronic progressive muscular atrophy has not been more definitely severed from the amyotrophic form of lateral sclerosis. It is surely accepted that *pure* forms of atrophy of the anterior horns, without implication of the lateral columns, do occur, and that either upper or lower neurons may be affected respectively or both conjointly; and we think that the retention of these separate forms of disease would have afforded the student a clearer conception of the subject.

In the chapter on tabes the author subscribes fully to the more modern view of its parasyphilitic origin, and indicates fully the close relationship it bears to general paralysis. In stating that the Romberg sign (static ataxia) is most marked in degeneration of the lower portion of the spinal cord, it might have been stated that the columns of Goll are chiefly constituted by the posterior roots of the first sacral nerves which supply the integument of the sole. We are glad to note that the identity of so-called pseudo-tabes with multiple neuritis is strongly affirmed by Dr. Church, under the head of diagnosis, yet strangely enough tabetic general paralysis is here omitted.

The chapter on trophoneuroses infection and motor neuroses is a model of what such descriptions should be. No ambiguous phraseology is apparent, but the clear, simple, yet comprehensive presentation of symptoms, etiological factors, diagnostic considerations, and principles of treatment, leave nothing to be desired. The essential points are assigned their full value. The author steers clear of non-essential and hypothetical detail, and as a result leaves on the mind of the reader a definite and vivid conception of what he would convey. This picturesque delineation is still further enhanced by the admirable illustrations which adorn this volume. The chapter on fatigue neuroses might have been extended with advantage, whilst neurasthenia and hysteria appear to usurp more than their just space.

The space allotted to mental diseases is wholly inadequate for the task to which Dr. Peterson devotes his attention, and it is not surprising that the natural outcome—a notable want of balance between the subjects dealt with—should be so apparent, a fault still more emphasised by contrast with the preceding section on nervous diseases. Nearly half of this section is devoted to preliminary considerations on classification, general etiology, symptomatology, and treatment. Whilst very special attention has been bestowed upon general paralysis, paranoia, and idiocy, all other forms of mental ailment are cramped into the meagre space of thirty-five pages. We fail to see why so many pages should be devoted to the clinical aspects of paranoia, whilst, with the exception of idiocy (which the author has evidently closely studied), the pathological aspects of insanity are almost entirely ignored. We do not think Dr. Peterson is of the opinion of a recent author,—that there is no pathology of insanity! He is too keen and cautious an observer to commit himself to such an absurdity; but we do protest against the overshadowing of the pathological by clinical detail, in a work intended specially for the student of medicine. The chapter on etiology, embracing a short description of the recognised stigmata of degeneration—anatomical, physiological, and psychic—is in every way excellent, and sufficient evidence that with further scope the author could have given us a most valuable treatise on psychiatry. It is to be hoped that in a future edition of this work this serious fault may be rectified, if necessary, by a second volume, for we are strongly of opinion that as it stands this section will not serve the student's purpose.

Apart from these blemishes, we have nothing but praise to accord to the work before us.
W. BEVAN LEWIS.

Die Störungen des Verdauungs Apparats als Ursache und Folge anderen Erkrankungen. By Dr. H. HERZ. Berlin: S. Karger.

DR. HERZ's work is typical of modern medicine. Not so many years ago, books dealing with all the diseases of the digestive organs, under every condition, would scarcely have exceeded this monograph in length and size. Now a large volume can be filled with the details of diseases and lesions of other organs and tissues of the body, as they influence or are influenced by the pathological states of the alimentary canal and the associated glands. The result is Teutonic in conception and minuteness. Full of minute detail, records of published work, and of references, it is a mine of information, solidly constructed, and impartially supported and timbered. Every "uitlander" lesion which can and does exert a malign influence upon the normal and abnormal conditions of the organs of digestion, is discussed and explained in turn. The digestive complications of acute diseases, of chronic affections of the lungs, heart, kidneys, nervous system, of constitutional defects, and of physiological and metabolic errors, are discussed in full. Among the more generally valuable sections are those on auto-intoxication, and on the intimate connection of the nervous system, local and central, with the abnormalities evidenced by various signs and symptoms of the tract.

Every page testifies to the strictly impartial spirit of the author, however militant the subject or pronounced his personal leaning; and the length of the bibliography appended to each chapter speaks for his industry. It is a work which merits translation into English, both as a storehouse of facts, many of them but seldom appreciated at their true value, and as a source of practical information upon common and less-known though important everyday matters.

A. LOCKHART GILLESPIE.

The Pathological Statistics of Insanity. By FRANCIS O. SIMPSON, L.R.C.P., M.R.C.S. London: Baillière, Tindall, and Cox. 1900.

THIS book contains the summary of a vast amount of industry in collecting and tabulating the various pathological changes found in the different organs of those dying insane. As only a twentieth part of the information collected has been published, the labour involved must have been immense. Statistics of this kind can hardly be endued with vital interest, nevertheless this work will prove exceedingly useful as a book of reference. It is devoted to a minute study of the results of 398 post-mortem examinations made in the Wakefield Asylum. The facts were arranged under 233 headings almost entirely devoted to the nervous system. Large sheets of paper, specially ruled for these headings, were used, each capable of holding eighty cases. As soon as an examination had been made, the results were entered on these sheets; and when a sheet was filled, percentages were easily calculated on adding up the various columns. When these figures were obtained, the sheets were cut up into individual cases, and these were further arranged according to the form of mental disease from which the patient suffered. Statistics on this basis of classification were thus obtained. It would have probably been better to make duplicate sheets for the latter purpose, as any error could thus be more easily corrected. Such an undertaking, however, might possibly have been too formidable.

The statistics of the insane brain are those to which naturally most attention is devoted. It is of course impossible to notice all the facts recorded. Perhaps the most interesting is the table of brain weights. The average was found to be for males 1344 grms., for females 1219. These were a few grammes less than was found by Clapham in the same asylum. The weights in various forms of insanity are also given, and compared with those obtained by Clapham. The differences in some classes are very considerable. For example, in organic dementia and in imbecility there are differences of nearly 100 grms. The reason for this is probably that in the newer series too few cases have been available to give a correct average. The value of an average depends on the number of individual instances included in obtaining it. Where these are few, accidental anomalies influence the result too much. If the author continues his investigations on the same lines, his data will become increasingly nearer the true average, and so become of greater value. An unfortunate error has been made in Table VII., in giving the brain weights and breaking strain of the ribs. The other figures in the table refer to both sexes, whereas those mentioned refer to males only. Such a mistake is serious, as statistics, to be of any value at all, should be absolutely accurate. It is true this error is corrected in the detailed table at the end of the book, but as Table VII. professes to give an abstract of the more interesting details of other tables, it is most likely to be the one consulted. The mistake is thus of more than ordinary importance, and would, moreover, escape cursory examination. With this exception, the figures, where trouble has been taken to verify them, have been found to be correct. It is to be hoped the author will continue his work, as it will become increasingly valuable with the number of cases considered. JAS. MIDDLEMASS.

Chirurgie de foie et des voies biliaires. Par J. PANTALONI (de Marseille). Paris: Institut de Bibliographe Scientifique. 1899.

THIS is a large volume, devoted to the study of all the operations which have been practised upon the liver, the gall bladder, and the biliary ducts.

The work is subdivided into four parts. The first deals with hepatic surgery proper; the second includes a description of the procedures practised upon the suspensory ligaments of the liver, the hepatic artery, the portal vein, and the lymphatic glands in the hilum of the liver; the third is devoted to a consideration of the surgery of the gall bladder and its cystic duct; whilst the fourth and last part comprises those operations which are performed upon the hepatic ducts and the common bile duct.

Each operative procedure is first clearly defined, and its various synonyms given; then follows a short historical account of the stages of the evolution of the individual operations,—the names of the surgeons who have contributed to them being mentioned; next comes an enumeration of the different varieties. Each operation is then separately described in detail, in most instances the procedure being divided into a number of stages, each of which is dealt with at length; and after this important points in the after-treatment of the patient are discussed. The results which may be expected are mentioned in general terms, and only occasionally are statistical results introduced. Finally the "indications" for each operation are enumerated.

That portion of the volume which deals with the operative procedures practised upon the liver is very complete. One omission, however, is noticeable. No description is given or mention made of the method of temporarily arresting hepatic hæmorrhage by applying digital or instrumental pressure to the hepatic artery and the portal vein, where they pass upwards between the two layers of the gastro-hepatic omentum.

Under the title of "Chirurgie des voies biliaires," is included a consideration and description of practically every operation which has either been practised on the human body—living or dead—or on animals, or has been invented by the fertility of the human mind. Thus such operations as "cholangio-enterostomy" and "choledochotomy by the lumbar method" receive full consideration, although they have not as yet been practised on the human liver and intestine.

As a guide to the actual performance of all hepatic and biliary operations, and as a book of reference to the work of those surgeons who have written upon this branch of surgery, the work of M. Pantaloni can be strongly recommended. The same measure of praise cannot, however, be given in respect of the clinical value of the work, or of the discussions about the relative value of the different operations.

H. J. Waring.

The Cerebro-Spinal Fluid: its Spontaneous Escape from the Nose. By St. Clair Thomson, M.D. London: Cassell & Company Limited. 1899.

In this monograph a very full and careful account is given of a case which came under the author's observation. The patient, a young woman of 25, suffered from continual dropping of fluid from the left nostril. This liquid was shown by analysis to be cerebro-spinal fluid, but its flow did not seem to interfere in any way with the general health, although at the time of publication it still continued.

After observing this case, the author collected details of as many similar instances from literature as were accessible to him. He succeeded in discovering eight others in which the nasal flow was undoubtedly composed of cerebro-spinal fluid, while in twelve more he thinks that all the facts make this probable. A careful consideration of the second class will, however, leave the critical reader in very considerable doubt as to how many ought to be included as "probably cerebro-spinal," and whether a certain number of them should not be classified among the "other possible cases," under which heading eight more are given.

A large amount of space is given over to questions relating to chemical analysis, and the concluding pages are devoted to "observations on the composition and function of the cerebro-spinal fluid in the human subject."

Careful conclusions as to diagnosis and pathology are also arrived at, so that, on the whole, we feel certain that the work will be looked upon as distinctly advancing the knowledge, not only of the rhinologist, but also of the neurologist,—not because it contains anything of striking novelty, but because it gives in a systematised form what is known of a very rare condition. P. M'Bride.

Skiagraphic Atlas of Fractures and Dislocations. By Donald J. Mackintosh, M.B. London: H. K. Lewis.

It is scarcely necessary at the present time to refer to the great assistance that has been afforded to surgery by the discovery of the X-rays. The influence that this has had in drawing fresh attention to the subject of fractures and dislocations, and in modifying our previous knowledge, is seen in the numerous articles and new books that have appeared of late years. In the work before us we have an illustration of what the X-rays are capable, in their application to certain surgical affections. The book contains a series of eighty skiagrams, with a short descriptive letterpress. So far as the skiagrams themselves are concerned, we can have little but praise. The greater number are devoted to fractures and dislocations, and cover fairly well the whole range of these accidents. In addition, there are photographs showing foreign bodies, and others showing the applicability of the process to inflammatory conditions and growths of bones.

The author has suggested in his preface that they may be useful to students, and there is no doubt that a good skiagram gives a better idea of the conditions to be met with in a fractured part than a diagram can do; and from this point of view they will well repay a careful perusal. On the other hand, it must be admitted that whilst the photographs in this book possess a certain amount of interest, they do not in themselves contribute anything to our present knowledge. The work would have been of much more use if the descriptions, instead of being so meagre as to be practically useless, had given some idea of the assistance that had been afforded by the X-rays in the diagnosis and treatment of the cases. Within the modest limits that the author has set himself, the book may be recommended to all those who wish to obtain some idea of the possibilities of this interesting branch of photography in its application to surgery. G. Bellingham Smith.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Glycosuria among Tramps.

Hoppe-Seyler (*München. med. Wchnschr.*, April 17, 1900) details five cases of working men, after tramping the country for longer or shorter periods, in whom temporary glycosuria occurred, with no albuminuria. It is interesting to note, in connection with Glénard's paper (see p. 590), that in each patient the liver was enlarged, greatly in two, and more resistant than in health, but gave no signs of any marked cirrhosis. All these patients had led an unsettled life, and their food had been meagre and poor. In hospital, on a mixed diet, rich in carbohydrates, the sugar rapidly disappeared from the urine in each instance, nor could a trace be found later, even after the ingestion of large amounts of grape-sugar. Hoppe-Seyler remarks that disturbances of the digestive organs, the liver, and the pancreas, and as well of the general nutrition, come into close causal connection with the glycosuria of vagrants, in whom bad food and insufficient nourishment, combined with circulatory and interstitial changes in the liver and the pancreas, suffice to produce it in certain of their number.

Alimentary Glycosuria.

Strauss (*Berl. klin. Wchnschr.*, 1900, No. 13) deals with the important point of the relationship between the sugar and starch of the food and excretion of sugar in the urine. He shows that in the milder cases only the sugar of the food influences the sugar of the urine, while in severe cases starchy food is also thus misapplied. He does not believe that true diabetes is the sequel in a large number of instances of alimentary glycosuria, but in giving a prognosis this possibility must be kept in mind. Patients suffering from pneumonia frequently have glycosuria after ingestion of sugar, and some also after starch, and those of alcoholic habits so long as they were under this influence. Alcoholic epileptics, as a rule, rapidly develop glycosuria on taking an excess of sugar or starch, provided that they have recently indulged in an alcoholic bout; and this fact may be of use in differential diagnosis, where it is difficult to determine whether fits are due to true epilepsy or caused by alcoholic excesses, genuine epilepsy showing no tendency towards the development of alimentary glycosuria.

Brugnola (*Gazz. d. osp.*, Genova, 1899, No. 135, referred to in *Centralbl. f. innere Med.*, Leipzig, April 7, 1900) disagrees with Johnson and Pittarelli, who have lately written on the methods of examining the urine in cases of glycosuria. They maintained that, if uric acid, creatinin, and the compounds of ammonia in the urine are first removed, none of the reaction of sugar in cases of temporary glycosuria remains in the urine. The author, however, having got rid of all nitrogenous substances by the Liebig-Pflüger method, has obtained positive results from the use of phenyl-hydrazin.

HEPATISM.

In a communication made to the Society of Medicine of Paris in May, Glénard (*Progrès méd.*, Paris, April 14, 1900) discusses what he terms "hepatism": localisation, the liver; characters of the diathesis, objective anomalies of the liver; functional troubles exhibited in the digestive organs with regular periodicity agreeing with those of the digestive acts; anomalies of sleep and of excretions: causation, secondary; functional disturbance of the liver; primary, personal, or ancestral liver disease, intoxications and auto-intoxications, infections, mental lesions, congenital defects; treatment, diathetic, purgatives, diuretics, alkalies, and a regimen proper to hepatic diseases. In other words, the disorders of nutrition form a natural group, a family *hépatique*, characterised by a chronic affection of the liver, acquired or inherited; and consequent upon this an acid dyscrasia, decrease or increase of metabolism, and a symptomatology fundamentally hepatic, that is, digestive. The various diseases of hepatism express phases in evolution of the chief morbid agent or lesion in the liver.

The members of the *famille hépatique* may be divided into two orders,—those with cholæmic hepatism, and those with uricæmic hepatism, or hepato-nephritism. The second class corresponds to Bazin's arthritism. Gout, diabetes, obesity, lithiasis, chronic rheumatism, enteroptosis, certain forms of chlorosis, neurasthenia, and dyspepsia are distinct forms of hepatism; many other diseases, such as migraine, membranous enteritis, etc., are examples of their several varieties.

Glénard enters at some length into the facts supporting the theory. Briefly, they may be given as follows:—Methodical palpation, systematically applied, obtains evidence that abnormal states of the pliancy of the liver are extremely frequent in diseases of nutrition, in dyspepsias and neurasthenia. Subjective symptoms, when analysed, afford proofs of the hepatic origin of many nutritive diseases. Thus, direct pressure over this or that portion of the liver provokes subjective symptoms identical with some which spontaneously occur in "hepatics."

Direct pressure applied over the liver allows one to simulate at will, in certain cases, not only local pains, but pains at a distance, such as frequently complicate undoubted hepatic disorders,—pain in the right shoulder, feelings of nausea, eructation, pains in the side, and many analogous symptoms. Again, many symptoms, at first sight regarded as diagnostic only of dyspepsia, neuropathies, or diseases of nutrition, when considered in the light of their connection with recognised hepatic lesions, may really be due to more complex, though less obvious, liver disturbances. If any of these symptoms—(*a*) Invariably accompany pronounced diseases of the liver, such as enlargement or cirrhosis; (*b*) vary in intensity with objective hepatic changes; (*c*) precede, as a rule, characteristic diseases of the liver, as catarrhal jaundice, congestion, or hydatid cysts; (*d*) occur habitually in the intervals of true hepatic attacks; (*e*) replace characteristic signs of, or succeed to, liver diseases; (*f*) or if they are amenable to the same treatment as regular hepatic ailments,—they may be looked upon as possible results of liver disturbances, although none of the classical signs of these be present.

Objective signs point in the same direction.

Condition of Liver.	Type of Disease.
Palpable, not hypertrophied, swollen, . .	Gastric dyspepsia, neuropathies.
Ptosed, ...	Enteroptosis.
Lowered, ...	Gravel.
Palpable, hypertrophied, ...	Biliary lithiasis.
Hypertrophied, indolent, soft or hard, . .	Diabetes, gout.

But this classification is subject to overlapping and variations.

Further arguments as to the matter must be gathered from the interesting original. The moral drawn is shown in the methods of treatment advised, *i.e.* treat the liver.

ŒSOPHAGEAL DIVERTICULA.

(1) JUNG (*Am. Journ. Med. Sc.*, Phila., April 1900). (2) FLEINER (*München. med. Wchnschr.*, April 17, 1900). (3) NEUMANN (*Centralbl. f. d. Grenzgeb. d. med. u. Chir.*, Jena, March and April 1900).—Jung contributes an article upon the diagnosis of diverticula of the lower part of the œsophagus which is full of interest and information. Only forty cases of idiopathic dilatation of the œsophagus have been recorded hitherto, and but five of true diverticulum of the lower part.

Rumpel has recently employed a most valuable method for the differentiation between dilatation and diverticulum of the œsophagus. A stomach-tube with numerous perforations in its lower third is passed into the stomach; another with one or two terminal eyelets, into the œsophagus, near to, but not beyond, the cardiac orifice. If the œsophagus be only dilated, water passed down the second tube will pass through some of the openings of the first into the stomach; if the end of the second tube has passed into a true œsophageal diverticulum, none of the water introduced through it can enter the stomach until the diverticulum has been completely fitted, and an overflow occurs. The disadvantages inherent to this test arise from the difficulty of correctly locating the real position of the ends of the two tubes. The actual entrance of the first tube into the stomach cavity can only be satisfactorily proved by the withdrawal of some of its contents and the application of appropriate tests. But none can be obtained through such a perforated tube, so Jung uses a double tube, an ordinary-sized stomach tube, perforated for the last 30 cms. of its length, which contains within its lumen a smaller one with two openings close to the end. The inner tube may be made of thin soft metal, giving the whole a stiffness. Some of the contents can be obtained by aspiration through the inner tube, before or after addition of water in known quantities, and the question of their characters determined; the stomach contents can be removed at will; the inner tube also can be removed, if desired, after deciding upon the nature of the fluids procured by its aid.

In an instructive illustrative case, Jung depicts the many diagnostic facts afforded him by this method. A male, æt. 64, twenty-four years before suffered from fulness after meals, rapidly developing into post-prandial attacks of cramp of an intense character. During the last four years had been almost unable to swallow, leaning his head back lessening this difficulty, and had felt a sense of resistance to the passage of food before it reached the stomach. He had lost much weight, and was thought to be suffering from cancer. On emptying his stomach, 300 c.c. of retained contents were recovered. Forty-one cms. from the teeth, the passage of the tube was met with some obstruction. Large tubes passed into the stomach more easily than thin ones. Employment of the double stomach and œsophageal tubes, as described above, demonstrated the existence of an œsophageal diverticulum, which was estimated from the water recoverable from it to have a capacity of 200 c.c. by measurement, and by use of the Röntgen rays to be 7·5 cms. in length; its orifice being about 9·5 cms. above the cardiac sphincter. Introduction of a solution of bismuth into the diverticulum, and photographing with the X-rays, showed it to lie towards the right side. This position rendered the passage of a tube into the stomach less difficult, especially if stiffened with a wire or an inner metal tube.

Lavage of the diverticulum rendered the patient quite comfortable; he rapidly put on flesh, and the cramps disappeared, aided by the use of small seidlitz powders.

Jung describes a second case, that of a female with somewhat similar symptoms, in whom a diverticulum was proved to exist.

The following points have to be considered in making a diagnosis of œsophageal diverticula :—

(1) With dilatation, as well as with diverticula, there occur painful cardio-spasms (Kelly, Jung), as well as painless cases (Reitzenstein). (2) In both, vomiting occurs from the œsophagus, occasionally from the stomach. Even in cases of typical cardio-spasms, eructation from the stomach may occur. (3) If food is vomited, eaten one or two days before, while other food eaten in the meantime remains down, the case seems to be one of diverticulum. No observations to the contrary have been made so far. (4) The swallowing sounds are abnormal in all cases of dilatation. In cases of diverticula, the swallowing sounds are audible in 33 per cent., and can be used for diagnostic purposes (Kelling's method). Westphalen's sound can also be heard in diverticulum, with dilatation of the œsophagus (Jung). (5) If, after emptying the œsophagus, it is easy to enter the stomach, a diverticulum probably

exists (Mintz, Reichmann). Yet the passage of the tube may be difficult. "Only once out of ten experiments does one find the cardia and gain entrance into the stomach" (Reitzenstein). (6) In making Rumpell's test, proof must be furnished that the tube is actually in the stomach. Inflation in this case is impossible, as feeling of the sound is not always practicable. (7) The proof positive of having entered the stomach is obtaining gastric juice through the inner tube (Jung). (8) Mercier's sound or Leube's diverticulum tube are necessary in order to find the entrance into the stomach. These tubes must be perforated for the diverticulum test, and by means of a thin inner tube gastric juice can be brought up. (9) After a diverticulum has been diagnosed, its height can be ascertained (*a*) by Kelling's test (swallowing sounds), and (*b*) by filling the diverticulum with a coloured solution and putting a narrow strip of white adhesive plaster longitudinally on the tube. (10) Neubauer's experiment for ascertaining the level of the liquid can also be used, according to Kelling, to determine the entrance into the diverticulum. (11) The entrance of the diverticulum can easily be overlooked by œsophagoscopy. (12) Gastro-diaphany did not show the diverticulum in Mintz's case, and gave no information about the kind of enlargement. In Reitzenstein's case it was possible to make the diagnosis diverticulum by gastro-diaphany alone. (13) X-rays show an enlargement of the œsophagus only. (14) The statements of even the most experienced patient, that the tube is in the stomach, are often erroneous.

Arnold and Luschka found in a number of autopsies dilatation of the œsophagus, immediately above the cardiac orifice of the stomach, which they regard as congenital, and term the fore-stomach or *antrum cardiacum;* and Fleiner (*vide* above) has met with nine other cases in which this condition probably existed. The diagnosis of dilatation of the œsophagus is easily made from the symptoms produced by stasis of food and saliva above the stomach cavity. Periodic local attacks of cramp, difficulty of swallowing, eructations, and merycism are common. The greatest obstacle to the differentiation between congenital or functional dilatation, and that due to organic morbid conditions, if a bougie or tube be employed for the purpose, arises from the contracture of the walls caused by its pressure. Frequently the results of treatment afford the only certain proof of the actual nature of the lesion.

Neumann finds that the following conditions are most important in regard to the diagnosis of œsophageal dilatation:—(1) Diverticula; (2) organic strictures; (3) paresis or paralysis of the muscular coat.

SURGERY.

UNDER THE CHARGE OF

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Branchial Epithelioma of the Neck.

Dr. Veau of Paris gives an excellent account of this comparatively rare disease, based on a personal observation of six cases, and an analysis of the forty-two cases previously recorded. The condition was first described by Volkmann in 1882, as originating in the remains of the branchial clefts. It may commence as an epithelioma, or the malignant element may be grafted on a dermoid cyst or congenital fistula of the neck.

It occurs almost exclusively in the male sex (forty-seven males, one female), resembling, in this respect, cancer of the tongue or pharynx.

The tumour is situated in the carotid region, about the level of the great cornu of the hyoid bone, and overlapped by the sterno-mastoid. At first small and movable, it gradually increases in size and becomes fixed to its surroundings. Its features suggest secondary cancer in the lymphatic glands, but no primary growth can be discovered. Pain is not a prominent feature. Ulceration occurs at an advanced stage, unless an exploratory incision has been made. In exceptional cases, it may cause embarrassment of respiration, alteration of voice, and difficulty in swallowing. The average duration of life is from six months to two years. Removal of the growth is both difficult and dangerous; the difficulty results from adhesions to the carotid artery, internal jugular vein, and vagus nerve; death has followed operation from respiratory complications, thrombosis of the internal carotid, etc. Removal should not be attempted unless at an early stage of the disease.

The diagnosis is usually suggested by the presence of a malignant tumour in the carotid region, resembling epitheliomatous lymphatic glands, and by the failure to discover a primary growth in the tongue, lips, pharynx, larynx, ear, or thyroid. The diagnosis may be difficult in advanced cases, when the branchial epithelioma has ulcerated into the pharynx or œsophagus, but it is then of little importance.

The following conditions may be mistaken for branchial epithelioma: —(1) Lymphosarcoma: this is met with in the cervical glands in younger subjects, and the tumour may be recognised as consisting of several glands fixed together. (2) Tuberculous glands may resemble the epithelioma, especially when there is only one large gland adherent to its surroundings. (3) Fibroma of the neck is more movable, more defined and regular in its outlines, and will change little when kept under observation. (4) Cancer of the submaxillary or parotid gland may closely resemble the branchial tumour. (5) Chronic inflammation and innocent tumours of the submaxillary gland may give rise to great difficulty in diagnosis. The abstracter has recently observed a case of chronic inflammation of the submaxillary gland associated with the presence of a small calculus in one of the ducts, which was clinically indistinguishable from epithelioma. (6) Cancer of an accessory or aberrant thyroid may not be recognisable until the tumour is subjected to microscopical examination. (7) Teratomata and dermoid cysts in the neck will only give rise to confusion in the absence of an accurate history, but it is to be remembered that they may undergo malignant transformation and conversion into branchial epithelioma.

The growth originates in the region of the great cornu of the hyoid; if below the hyoid, it approaches the thyroid cartilage internal to the vessels; if above the hyoid, it fills up the posterior part of the submaxillary space outside the vessels, and lying partly under cover of the angle of the jaw. It may send prolongations in all directions. It is nearly always adherent to the anterior aspect of the internal jugular vein near the entrance of the linguo-facial trunk; it may also be adherent to the carotid artery, to the vagus, to the digastric and sterno-mastoid muscles.

The lymphatic glands are not commonly infected; those above the clavicle or in the region of the parotid may be involved; generalisation of the cancer is quite exceptional.

A section of the tumour presents a waxy white, fasciculated appearance, not unlike some cancers of the breast; sometimes it undergoes softening into a creamy fluid, which may be grumous from the addition of blood pigment. Its histological characters are somewhat complicated compared to other epitheliomata; the epithelial cells may be arranged in groups, or in anastomosing columns, or may be isolated in the stroma, with occasional cell nests and colloid vesicles. The stroma is a prominent element of the tumour; it is fibrous or myxomatous, and may contain cartilage cells.

As regards their origin, the author excludes that from lymphatic glands, aberrant thyroid or thymus or salivary or carotid gland, and supports the original contention of Volkmann, that they originate from embryonic remains of the branchial arches, although he is unable to furnish any direct proof of this.—*Rev. de chir.*, Paris, March 1900.

OPERATIVE TREATMENT OF CARBUNCLE.

MADELUNG is an advocate of the operative treatment of carbuncle; he objects to complete excision, because it is a severe operation attended with loss of blood, needless sacrifice of tissue, and a considerable scar; for several years he has been very successful with the following operation:—The carbuncle is encircled on three sides by an incision (down to the muscle), forming a tongue-shaped flap, with the carbuncle in its centre; the flap is rapidly reflected like the skin flap in an amputation; bleeding is arrested by inserting a large pad of gauze between the flap and the bed from which it was taken, and applying pressure; with the sharp spoon all obviously dead tissue is removed from the deep surface of the flap, and the entire wound is disinfected; the flap is replaced over a pad of gauze, and a dry dressing is applied. After an interval varying from the sixth to the ninth day, the flap is united by means of sutures. It is said to be surprising how little of the carbunculous flap dies.—*Centralbl. f. Chir.*, Leipzig, March 31, 1900.

THE CONTAGIOUSNESS OF ERYSIPELAS.

HAGLER AND RESPINGER, in order to determine whether erysipelas is contagious or not, have made a number of culture experiments with the epidermis, and with the contents of blisters taken from a large number of cases of erysipelas. They were unable to cultivate the streptococci, and concluded, therefore, that when the skin of the patient is unbroken, erysipelas is not a contagious disease. When there is an open wound, it is possible that the dried discharge might be disseminated and convey the infection to others, but this risk is easily avoided by preventing the drying up of the discharge. As regards the risk of a direct transferen of the infection by the fingers of the surgeon, from one patient to another, this is less likely to occur than in other streptococcal infections. The conclusion arrived at by the authors is that there is no object in isolating cases of erysipelas; if they are to be isolated at all, it should be along with other septic cases.—*Centralbl. f. Chir.*, Leipzig, April 14, 1900.

THE PERMEABILITY OF THE ILEO-CÆCAL VALVE TO FLUIDS INTRODUCED INTO THE COLON.

M. **MAZERAN** assumes that the permeability of the ileo-cæcal valve is now generally accepted. In order that fluid may pass through it into the small intestine, a large quantity must be introduced at a very feeble pressure. The opening of the valve is supposed to result from an antiperistaltic movement of the colon, induced by the accumulation of fluid in its interior.

The patient should lie with the left hip raised on a pillow, or in the first instance he may lie on his back, and then roll over on to the right side, so as to fill the different parts of the colon in succession. An ordinary soft rubber stomach tube (in children, a rubber catheter) is connected with a graduated glass reservoir, placed at a height varying from one to five feet above the patient. The tube is lubricated, and is passed into the bowel for about twelve inches; if possible it should reach the transverse colon; according to the author, it may be felt in this situation by palpation of the anterior abdominal wall. The fluid is allowed to flow very slowly so as to gradually fill the entire colon. If the gas in the bowel hinders the flow, one must wait a few moments, or slightly alter the position of the rubber tube, or elevate the reservoir. In average cases, about 5 pints will fill the colon, while twice that amount will pass through the small intestine; its entrance into the stomach is attended with nausea, and may be demonstrated by passing a tube down the œsophagus. The accumulation of fluid in the cæcum may be recognised by palpation, succussion, percussion, and auscultation. When the fluid enters the small intestine, dulness appears above and to the right of the bladder, and at the sides of the abdomen, while the note becomes more resonant in the region of the umbilicus.

As applied to the colon, the procedure is one employed in everyday practice; as applied to the small intestine, it can be but rarely indicated. The practical point is to introduce the fluid slowly and at a very low pressure.—*Lyon méd.*, February 18, 1900.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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PARTURITION AMONG THE ESQUIMAUX.

C. C. **GREAVES** (*Pacific Med. Journ.*, San Francisco, Dec. 1899), while spending the winter in North-western Alaska as surgeon on the United

States steamer *Bear*, had the opportunity of witnessing the confinement of an Eskimo woman. This was very unusual, as custom demands that no one be present on such an occasion. The woman may not be confined at home, but must go away alone into the woods, and remain there till five days after the birth of the child, with no food except a piece of dried fish. Afterwards she returns to her home, when she and her husband take a bath and change their under-garments, and the woman is considered clean until her next confinement. One night, the temperature ranging from 30° to 40° below zero, the writer was informed that a woman was about to be confined. She was out in the brush in a snow pit, oval in shape, about 2 ft. deep, which she had prepared for herself by scattering dried grass, with a reindeer skin for a covering. The woman was on her knees, with the buttocks resting on her heels, the labour-pains being rapid and severe. Labour progressed naturally through the second stage, and in half an hour the pains returned; the woman suffered from syncope, probably from hæmorrhage, but soon rallied and expelled the placenta. She then took a piece of linen, tied the cord near the umbilicus, and severed the cord with a piece of serrated flint. The child was then washed vigorously in the snow and placed underneath the folds of the mother's garment. The woman in a bent position, and assisted by a staff, slowly proceeded to another snow pit about 50 ft. distant (as it is considered unclean to remain any length of time at the place where the child was born), leaving a trail of blood behind her in the snow. Notwithstanding the rigorous conditions associated with childbirth among the Eskimos, the rate of mortality among both mothers and children compares favourably with that in more civilised nations.

OVARIAN (?) ABSCESS OPENING THROUGH SINUSES AND HEALED WITHOUT OPERATION.

LOUISE C. DROUILLARD (*Woman's Med. Journ.*, Toledo, Dec. 1899) was called to see a coloured woman, æt. 66, who had been bedridden for eleven years. Her first child was born when she was 18 years of age, after a labour of seventy-two hours. Next year, after a labour of five days, a child was delivered by forceps, the canal being lacerated and bruised. The puerperium was complicated by septicæmia of long duration, with bed-sores and a vesico-vaginal fistula. Menstruation was regular but painful, and there was profuse leucorrhœa. In 1870 she had pain in the right side, extending down the leg. A tumour, probably ovarian, developed gradually, attaining the size of a five months' pregnancy in 1880. About this time an external sinus opened in the right side of the gluteal fold. Three years later a second sinus appeared in the middle line, half-way between the umbilicus and the pubes. After six months a third sinus appeared in the right groin, followed three years later by a fourth at the umbilicus. Before the appearance of these external sinuses there had been an opening into the bladder, so that pus was discharged with the urine. Pain had been constant and severe. When seen in 1892, the tumour was the size of a man's head, and was discharging about a pint of pus per day. The temperature was 102°, accompanied by cough, night sweats, and muscular degeneration. A catheter was inserted into the umbilical sinus, and water from a fountain syringe allowed to flow freely through all the sinuses. After three months' washing with peroxide of hydrogen, and a saturated solution of salicylic acid, the tumour was reduced to the size of an orange, and the distended abdomen had become softened and retracted. She learned to walk again in six months, as a result of massage. The sinuses have now all healed, and the patient is well and at work. Examination showed that a contracted pelvis had been the cause of her protracted labours.

BEEF-GALL ENEMATA IN THE TREATMENT OF POST-OPERATIVE OBSTINATE CONSTIPATION AND INTESTINAL OBSTRUCTION.

F. C. AMEISS (*Ann. Gynæc. and Pædiat.*, Dec. 1899) says that the shock of a severe operation, septic infection, or injury to the nerve supply of the muscular coat of the intestine, may induce paralysis of peristaltic movement, thus causing intestinal obstruction. Other causes of a mechanical nature, are adhesions, peritoneal bands, volvulus, etc. In many cases only a reopening of the abdomen will give relief, but in the writer's experience it has several times been possible to avoid this by the effectual use of enemata of fresh ox-gall and water, from 6 to 8 oz. of each. In one case, where there had been fæcal vomiting, repeated enemata of ox-gall and warm water relieved the obstruction, and the patient recovered. The treatment was kept up for three weeks, repeated every second or third day. When, during an operation, it has been found necessary to break up adhesions to the intestines, an early resort (thirty-six hours after operation) to ox-gall enemata, which will cause free intestinal peristaltic movements, will prove a factor in avoiding serious consequences. The ox-gall is not only a natural purgative, but a good antiseptic. Even in protracted cases of constipation, but where evidence of strangulation is not unequivocally manifested, it should always be given a trial.

ECTOPIC PREGNANCY.

J. B. PERKINS (*Med. News*, Phila., Nov. 4, 1899) reports a case in which there were dermoid cysts in both ovaries, pregnancy in the right Fallopian tube, and almost complete obliteration of the left tube. The patient had never menstruated regularly, menstruating at the most three or four times a year, the flow being absent often for six or eight weeks.

Heinricius (*Arch. f. Gynaek.*, Berlin, Bd. iv. S. i.) reports a unique case of tubal pregnancy, in which one tube contained two ova of different periods of pregnancy. The patient presented a large abdominal tumour, smooth in outline, which did not resemble an ectopic gestation. Dilatation of cervix with laminaria was followed by general peritonitis and death. Post-mortem showed necrosis and perforation of a coil of intestine. The tumour was formed by the enormously enlarged left tube, and contained two full-term children. One fœtus was well preserved; the other was entirely disintegrated, and must have perished years ago. The patient's history shows that about six years ago she had amenorrhœa, nausea, and an abdominal swelling. A year later menses returned, and abdomen decreased in size. Amenorrhœa and vomiting returned a year ago, with gradual increase of abdomen and fœtal movements. Some time ago fœtal movements ceased, accompanied with decrease in size of the abdomen. The author concludes that the patient's right tube became impregnated at six-year intervals.

Schwarz (*Centralbl. f. Gynäk.*, Leipzig, 1899, No. 47). Patient felt life, and breasts contained milk. No other symptoms. Supposed period of pregnancy ensued without labour taking place; instead, the patient's abdomen smaller, and she complained of pain and fever. Some months later there appeared an abdominal fistula, discharging stinking pus and bone fragments. When first seen by the author, the lower abdomen was the seat of a swelling about the size of a fœtal head; this was opened, and large quantities of pus and a full-termed macerated fœtus were removed.

Cackovic (*Centralbl. f. Gynäk.*, Leipzig, 1899, No. 47). Patient stated that about a year ago she first noted a tumour in the right side, which gradually grew larger, and caused much suffering. An ectopic pregnancy was diagnosed, and immediate laparotomy showed a six months' macerated fœtus lying free in the abominal cavity. The placenta and membranes were adherent to the intestines, and could not be removed. Tamponade after Mikulicz. Gradual recovery.

DELIVERY OF A LIVING CHILD BY FORCEPS AFTER THE MOTHER'S DEATH.

FLEISCHMANN (*Centralbl. f. Gynäk.*, Leipzig, 1900, No. 4) refers to the rarity of such cases, and quotes those previously reported. In 1883 Heinricius applied the forceps, and delivered a large male child immediately after the mother's death from rupture of the aorta; and in 1888 Piskacek reported a case for Breisky's klinik, where the mother died from heart disease during labour, forceps being then applied and an asphyxiated child was delivered, but died in thirty-six hours. In Fleischmann's case, the patient, æt. 38, suffered from mitral and aortic disease. Hot douches were ordered for rigidity of the os, after the patient had been twenty-four hours in labour. During the second stage the patient collapsed, pulse and respiration ceasing after the introduction of the first blade of the forceps. The next ten minutes were spent in endeavouring to revive the mother, but, as all attempts proved useless, the second blade was introduced, and an asphyxiated female child rapidly extracted. The child was resuscitated, and lived.

THERAPEUTICS.

UNDER THE CHARGE OF

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THE TREATMENT OF LUPUS AND SKIN DISEASES BY RÖNTGEN RAYS.

THE reaction of the normal skin varies with the individual, as neither sex, age, nor complexion seem to have much effect, and personal idiosyncrasy plays the chief rôle. Some skins react to a single applications of the rays, while in other cases the applications may be repeated for months without causing reaction. In some cases the reaction is not immediate, but only sets in some days after the exposure. This is possibly connected with the vacuolisation of the intima of the vessels noted by Gassmann. In a healthy skin the first sign of reaction is a yellowish discoloration, which becomes hyperæmic, turning first bright red and then dusky red. Simultaneously, many patients experience prickling and slight itching, which may increase to a burning sensation. There is no local rise of temperature. Along with the redness there is usually a serous infiltration, giving rise to stiffness and tension. The swelling is visible, and to palpation feels firm and tense. If the rays be continued, the red colour deepens, and small blisters form, gradually spreading over the whole exposed area. The blisters burst, forming excoriations, and the whole surface becomes reddened and wet, resembling a burn. Instead of superficial excoriation, deep gangrenous ulceration may form, with little tendency to healing. On stopping the rays, slow healing from the periphery occurs, with diminution in the œdema. Eventually a rosy skin without cicatrix is left, which only becomes normal after months. If the rays be stopped at the stage of commencing hyperæmia, the hyperæmia, after increasing for a day or two, remains stationary for some time, and gradually fades, leaving the skin yellow with hyperæmic patches. Elasticity is diminished; the skin is leathery and covered with scales; hairs fall out, and sensibility is impaired. There is peculiar displacement of pigment. The periphery becomes stained deep yellow-brown, the central parts become white and free from pigment, except for scattered freckles, which may readily be mistaken for fresh lupus patches, as the pigmentation does not fade for some months. The loss of hair, sometimes permanent from atrophy of follicles, is usually only a temporary disorder of nutrition. The finger nails become very thin and brittle, and show a deep transverse ridge. The authors never saw bad results from a single application of the rays, and in reported cases the application must have been too prolonged.

The action on diseased skin, *e.g.* lupus, is as follows:—There may be a reaction causing dermatitis with redness, involving both sound and diseased skin, causing loss of epithelium and general exudation. When this has healed, the tubercles have vanished, and cannot be detected in the smooth, apparently normal skin, and the cure is perfect. Excoriations delaying the healing are very apt to occur in the face, especially if previous treatment has made the skin more vulnerable, or if it be thickened by eczema. If there be no reaction, the tubercles heal in two ways. The scales fall off from the reddened infiltrated patches containing the tubercles. The patches become smooth and lighter, approaching the normal skin, and the individual tubercles become very evident, owing to their dark colour and prominence. The tubercles become covered with a scale, flatten, and dry up, and at the same time the pigment fades and eventually returns to the normal colour. With the shedding of the scale, healing is complete. In some cases the tubercles become more prominent, with active hyperæmia round them, and then gradually dry up. If there be ulcers, these heal rapidly, secretion stopping after a few applications, with formation of a scab; healing takes place from the periphery. The cicatrix is good, and eventually becomes soft and pliable. In some obstinate cases, after months of treatment, no reaction occurred. Swelling and eczema disappeared, but tubercles remained prominent, and did not become absorbed. This is especially the case if the rays cannot be applied perpendicularly. Such cases require preliminary treatment with Unna's green paste, or electrolysis. Often, after completed treatment, small dark pigment patches remained at site of tubercles. Perhaps these are simply unabsorbed pigment, or may be commencing relapses.

The authors claim to have cured 30 per cent. of their cases, and in the remainder distinct improvement was apparent. As with all methods of treatment, some cases relapsed. In the last two papers the authors give detailed descriptions of their cases, and also the histological condition of a tubercle in the process of healing. The cases cured by the authors included fresh and inveterate cases, which had resisted all other methods of treatment. The treatment varied in length, some cases requiring fifty applications of the rays, spread over a period of two or three months. The action of the rays on a variety of other skin diseases, especially eczema, was then investigated, and a number of illustrative cases are detailed. In a general summary of their results, the authors claim that the rays have a distinctly curative action on lupus and other skin diseases. They are especially efficacious in overcoming eczematous and elephantaic conditions accompanying the lupus. This method of treatment lends itself well for treating flat surfaces of large extent. Relapses occur, but not more frequently than with other lines of treatment. Ray treatment may be combined with other measures. What has been said of lupus applies equally forcibly to eczema; and finally, by proper manipulation and correct apportioning of dose, the authors think that it is possible to avoid unpleasant effects, such as dermatitis, excoriation, and gangrenous patches.—Albers, Schönberg, and Hahn, *München. med. Wchnschr.*, 1900, Nos. 9, 10, and 11.

THE INFLUENCE OF ICHTHALBIN ON THE METABOLISM AND INTESTINAL FUNCTIONS OF CHILDREN.

ICHTHALBIN is an albuminous compound of ichthyol. The authors have studied its action on nutrition by means of metabolism experiments on healthy boys, and its anti-putrefactive action in intestinal disease by ether-sulphuric acid estimations. The metabolism experiments extended over four weeks, and were carried out in two healthy boys of 13, who were kept on a strict diet during this time. After a preliminary period of nitrogenous equilibrium of fourteen days, ichthalbin was added to the diet in doses of 8 and 3 grms. respectively. Its action became apparent on the third day, when there was a distinct diminution in the nitrogen excretion in the urine, and it was calculated that 6·5 grs. less albumin were consumed in the body. On the fifth and sixth days the effect on the nitrogen in the fæces became evident; it fell from 1·5 to 0·6, and in the other case 0·8 to 0·5. This shows that there was a much better utilisation of the albumin by the organism. From the tenth day of the administration of the drug its effect is at its height, and the retained nitrogen averaged daily respectively 1·54 and 1·02 grms. On stopping the drug there was a rapid fall to nitrogenous equilibrium. These two experiments confirm the favourable result of the drug on albumin metabolism, previously noted by Zülzer and Helmers. While on the strict diet the children lost weight, but with the addition of ichthalbin to the same diet they steadily gained 450 and 500 grms. respectively. That the ichthalbin is absorbed is proved by the total sulphur being excreted in the urine. In the second part of the investigation three patients suffering from chronic intestinal disease were put on a strict diet, and, by means of Baumann's method of estimating the ether-sulphuric acid of the urine, the action of ichthalbin in lessening intestinal putrefaction was studied. In each case the addition of ichthalbin within three days reduced the amount of ether-sulphuric acid to one-fifth to one-fourth of the original amount. The stools did not lose their stinking character. On stopping the drug, the compounds rapidly regained their former amount. To induce a permanent result, the administration must be continued for a long time. The authors think that if their results are confirmed, ichthalbin may replace calomel in all cases where it is not necessary to have a purgative action in addition to the intestinal antiseptic action. Ichthalbin has the further advantage over calomel, that it can be given for long periods without lowering the system by causing diarrhœa.—Rolly und Saam, *München. med. Wchnschr.*, 1900, No. 14.

THE ACTION OF DORMIOL, A NEW HYPNOTIC.

PETERS (*München. med. Wchnschr.*, 1900, No. 14) describes dormiol as an oily, colourless liquid with a cooling, biting taste. It is a combination of 1 molecule of chloral hydrate with 1 of amylene hydrate. It is supplied by the manufacturers, either as pure dormiol or as a 10 per cent. watery solution. Peters has tried the drug in forty-five cases of functional or organic sleeplessness. In all cases the drug was readily taken, either as the watery solution in milk or in gelatine capsules. In 84 per cent. of the cases sleep resulted, especially good results being obtained in sleeplessness due to functional neuroses. In organic disease of the nervous system and other organs, dormiol proved efficient in relatively small doses. As initial dose, which usually sufficed, 0·5 grms. was given. Sleep occurred in from half an hour to an hour. In some cases up to 2 grms. were given, but in no case did a craving develop, nor were unpleasant after-effects noted. In price dormiol compares favourably with the other hypnotics ; thus, paraldehyde is twice, trional and amylene hydrate three times, as expensive per dose. Peters recommends dormiol, because it is easily taken in doses of from 0·5 to 2·0 grms., causes no harm ; it is cheaper, and at least as efficient as trional paraldehyde and amylene hydrate.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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VICARIOUS HÆMORRHAGE AND ITS MEDICO-LEGAL SIGNIFICANCE.

SCHAEFFER (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1900, Heft 1) records a very interesting case of periodic hæmorrhage, from the stomach or lungs, of a young woman who had been the victim of a criminal assault. He further discusses in an able manner the whole question of vicarious hæmorrhage, and for his views on the subject the article itself should be consulted.

The case of rape and its after history is, however, of sufficient interest to be quoted here. A girl, æt. 20, healthy, neither tuberculous nor neuropathic, was criminally assaulted on 4th July with great brutality by a man. After attempting to defend herself for some time, she became unconscious, and was unable to remember many circumstances which took place both before and after the attack. She returned home, her clothes torn and disarranged, her umbrella broken, and in a state of great collapse. The same evening she coughed up a quantity of blood, and during the next five days similar hæmorrhage recurred at intervals. She suffered subsequently from great weariness, trembling, profuse perspirations, and flushings of the skin. On the 28th of July coughing up of blood again occurred, and lasted for five days. On the 28th of August the bleeding from the mouth recurred, and lasted for six days.

Schaeffer, whose opinion was asked by the Court, as to the connection between these bleedings and the criminal assault, is of opinion that they were the result of vicarious hæmorrhage, related to her menstrual periods. She had previously been perfectly regular in her menses, which were abundant, unaccompanied by pain, and lasted from six to eight days. After the assault the menstrual flow was very scanty, lasted only two days, and was accompanied with great pain and discomfort. Frequent and careful examinations of the organs of the chest and abdomen failed to disclose any pathological condition to account for the hæmorrhage, and Schaeffer is therefore of opinion—occurring as they did at the usual menstrual period—that they were directly related to it, and to be regarded as vicarious menstrual hæmorrhages. Looking to the close connection between the nervous and circulatory systems, as evidenced in other ways, he thinks that the great nervous shock which she sustained at the time of the assault, which showed itself for a considerable time afterwards in other symptoms, is a sufficient cause to account for the phenomenon.

THE MEDICO-LEGAL ASPECTS OF DEATH FROM STARVATION.

DÜNSCHMANN (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1900, Heft 2) gives the following conclusions, as a result of an investigation made by him into the question whether in death from starvation definite evidence of this cause of death is to be found in the body:—(1) The metabolic changes in starvation cause an almost total disappearance of fat (lipoma excepted). (2) In the urine, phosphoric acid and potash exceed in amount chlorine and sodium, which is contrary to the usual relations of these substances. (3) The amount of sulphonates is increased relatively to the amount of sulphates, although not to such an extent that one can rely upon this evidence alone in the diagnosis. (4) It is possible (or probable) that the excretion of hippuric acid undergoes a characteristic change. This point requires further investigation. (5) So far as is at present known, the acetone and diacetic acid excretion in the urine in starvation is so much increased, that a valuable aid in the differential diagnosis is thus afforded. (6) Only an exceedingly small quantity of fæces is formed, therefore the intestines are almost empty, and strongly contracted in places. (7) It has been determined by experiments upon animals—(*a*) That adipose tissue loses to the extent of nine-tenths of its weight; (*b*) muscle, three-tenths to four-tenths; (*c*) the liver to the extent of over half its weight; (*d*) the spleen to the extent of two-thirds. (8) It is possible that the histological examination of the spinal cord may afford in the future a valuable diagnostic criterion for death from starvation, provided corroboration is obtained of the observation that changes in the Nissl bodies of the ganglionic cells in the anterior horn occur constantly. (9) Inanition may favour the development of tuberculosis; the relationship between the two conditions requires, however, further investigation. (10) The post-mortem appearances in human bodies are as follows:—The stomach is contracted, so that it is smaller than the colon, and is either empty or contains only a little fluid. The intestines are also either empty or contain a few hardened fæcal masses. The intestinal walls are thinner than normal.

The liver and spleen are greatly diminished in size, even to the half of the normal size, or to a still greater degree.

Distension of the gall bladder has been stated as a reliable sign, but, on the other hand, cases have been described where this condition was absent.

In children under 1 year of age, the thymus gland disappears down to minute proportions.

THE DURATION OF THE EXCRETION OF ARSENIC.

A *cause célèbre* which occurred in Moscow some years ago incited Scherbatscheff (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1900, Heft 2) to an investigation of a question which has frequently given rise to differences of opinion among medical jurists, namely, the question of how long after the administration of arsenic its presence can be detected in the tissues of the body, and what period of time is required for its total elimination.

From experiments on dogs he concludes as follows:—

(1) Even after therapeutic doses, arsenic remains for a long time in the organism, more especially in the brain and bones. After subcutaneous injection, the longest period noted by him was 160 days, the quantity of arsenic injected being 4 mgrms. daily over a period of twenty-five days. (2) The duration of the excretion of arsenic from the organism depends chiefly upon the total dose administered. (3) The excretion of arsenic by the urine ceases before it begins to disappear in the brain and bones. (4) Usually an increase in weight takes place both when the arsenic is injected subcutaneously and when it is administered along with the food. This increase of weight was, however, only noticed in those cases where the dose of arsenic was not less than ½ mgrm. With fatal doses the weight is not increased, but, on the contrary, rapidly diminishes. (5) Arsenic remains for a longer time in the brain and bones than in other organs of the body. After a short period of administration, according to the author's observations, it is found longest in the brain; but after more extended periods of administration it is retained longest in the bones.

THE ANATOMICAL PROOF OF DEFLORATION.

PROFESSOR ALBIN HABERDA (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, 1900, Bd. ii.) in this paper discusses the appearances presented by the hymen in cases of rape or criminal assault, which have come under his notice in his official capacity as medico-legal expert to the Courts of Vienna.

The common opinion that the intact hymen is an almost certain sign of virginity, and that therefore an accurate conclusion can be drawn as to the virginity or defloration of a woman, from an objective examination of her genital organs, Haberda strongly condemns, and shows, from a large number of instances, how often even after complete penetration in young children, as well as in mature women, no evidence of defloration may be present, the hymen remaining intact and uninjured. Many of the mistakes which are made by medical men, when asked to give an opinion in such cases, arise from ignorance of this fact, and from not being acquainted with the appearance presented by different varieties of hymen met with, and the form of its free border, as well as the normal size of the opening and extensibility of the tissues composing the hymen.

Objective signs of defloration may be absent after connection, from two causes. First, because, as a matter of fact, no lesion has resulted from the act; and, secondly, because (when the examination is delayed for some time) the injuries have become unrecognisable as such. Injury of the hymen may be absent after connection, owing to the peculiar form of the hymen preventing such a result; as, for example, in the (*gelappte*) lobulated (fimbriated) hymen, of which variety several cases came under the author's notice in young children, who had suffered complete penetration without injury. In other instances, it is less the form of the hymen than the original size of the opening, the extensibility of the tissues, and the resulting capacity for dilatation, which renders possible the penetration of the penis, even of a full-grown man, without injury or rupture of the free margin of the hymen.

With reference to the distensibility of the hymen, Haberda found it to vary very much, and in certain experiments which he performed post-mortem, he was able to pass glass cylinders of considerable size into the vagina without rupturing or injuring the parts in any way.

Thus, in a girl, æt. 15½, he passed a cylinder measuring 4·4 cms. in breadth and 14·8 cms. in circumference, through the ring-shaped hymen without causing any rupture.

In forty cases of rape, in females varying from 10 to 28 years of age, in whom complete penetration took place, and frequently, repeated acts of connection, Haberda found that about 50 per cent. showed no anatomical lesions or signs of defloration. In regard to the appearances which are found in hymens which have been injured during connection, and which may only be seen some time after the rupture has healed, the author warns us against the error of mistaking irregularities or natural fissures in the free margin for evidence of a former rupture. It is often difficult to give a definite opinion in such cases, but Haberda holds that a reliable sign of a healed rupture of the hymen is its complete division at one or more places, the edges of the cleft being distinctly separated, while at the base the vaginal wall is exposed, even though only to the slightest extent.

The paper is one of very considerable interest and value, and while the chief facts are well known, yet the questions dealt with come so often under the consideration of medical practitioners, who not unfrequently arrive at wholly unjustifiable opinions in such cases, that a perusal of the whole article is to be recommended.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

GEORGE A. BERRY, M.B., F.R.C.S.Ed.,

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AND

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OPERATIVE TREATMENT OF ERRORS OF REFRACTION.

HELMHOLTZ proved a long time ago now that increase of the intraocular tension may have the effect of flattening out the cornea to some extent,—of increasing the radius of its curvature. It has been proved further that lowering of the tension tends to increase the acuteness of the curve of the cornea, and that, when tension rises, the effect is greatest upon the meridian of highest curvature, should any astigmatism be present, while the contrary is true in the case of lowered tension. In cases in which the tension has remained lowered for some time, the pressure of the lids upon the globe tends still further to increase the curvature in the vertical diameter at the expense of the horizontal meridian. What is more singular is, that a meridian is not necessarily similarly altered by the alterations of tension along its whole length, but the peripheral portions may be affected by an influence which does not make any difference to the more central parts. This matter of the reaction of the eye to tension has considerable bearing upon the existence of astigmatism in glaucoma. It is a well-known fact that in glaucoma perverse astigmatism is not unusual, and several observers have shown that this astigmatism does not always remain the same, but varies from time to time, probably according to the influence of the varying increased tension. It is interesting in this connection, too, to note how, when the tension is normal, tenotomy of a rectus muscle for squint has no effect whatever in producing astigmatism, though it must be noted that minor degrees of astigmatism are very frequent in the squinting eye, and it is not outside the range of possibility that the constant pressure of the muscles may have to do with its development. A very high degree of astigmatism is constantly to be found immediately after the operation for cataract, amounting in some cases to 9, 16, or even 22 D. This is produced by a double change, increase of the horizontal, and diminution of the vertical curvature. This astigmatism becomes less, quickly at first, more slowly later on, and may disappear entirely after a time. Many attempts have been made, acting on these lines, to attack corneal astigmatism by operation, of which perhaps the most successful have been those of Lans. He was able to produce in rabbits an astigmatism of 4 to 6 D, by means of non-perforating wounds of the cornea, involving about two-thirds of its thickness. These are made with the cautery, parallel to one another at opposite ends of one meridian, and about 2 mm. from the limbus corneæ. In a certain number of cases of conical cornea, Reymond of Turin has had good results from making a puncture and counter-puncture at the base of the most projecting portion, repeated in the opposite direction in a few days; but in summing up the results of operative interference for errors of refraction, he says that while for a condition so serious as conical cornea one might run a certain risk with advantage, it is not likely that any surgeon will think himself justified in exposing his patient to the danger of a central nebula of the cornea in a case simply of astigmatism. So far as our knowledge takes us at present, we cannot produce sufficient permanent change in the curvature of the cornea to make it worth while to operate, without going dangerously near the centre of the pupillary region.—*Klin. Monatsbl. f. Augenh.*, Nov. 1899.

THE DETECTION OF MALINGERING.

A MALINGERER learns by experience more and more of the tests applied for the discovery of his fraud, and with each new examination adds a new accomplishment, so that the test which trips him up once is successfully passed in the next consulting-room. It is therefore desirable to have a considerable selection of traps and pitfalls for him, of a kind which he is not likely to be able to avoid. Fridenberg suggests a little device which has some claims to attention. To the two sides of a spectacle frame, in such a position that they cannot be seen directly, are fastened cards, bearing types which appear alike whether seen in mirror or directly (such as O and A), or illiterate types, or mirror-writing. From the nose-piece of the frame projects a straight bar with a cross-piece, on either hand of which a mirror can be affixed. This mirror rotates about a vertical axis, the precise position at any moment being indicated by a pointer upon a scale at the back of the mirror. The mirror can be so placed that it can reflect into either eye either of the test cards. Thus, with the mirror opposite the patient's left eye, he can read either the left or the right card with either the right or the left eye, by slight alteration of the angle of the mirror; while at the same time the unused eye sees nothing, and the unused card is invisible. Exactly the same occurs when the mirror is before the right eye, while under no circumstances can print be read with both eyes at the same moment. The mode of use is briefly thus: Suppose the patient asserts that his left eye is blind, the mirror is put before his right eye in such a position that he can plainly see in it his own right eye. If under these circumstances he is able to read type, he does so with his "blind" eye, for it, and it alone, can receive an image of print while the mirror is in that position. It is easy to see how many opportunities it is possible with this little apparatus to give to a fraudulent claimant to make mistakes involving detection, for, even while one is speaking, a very minute turn of the mirror removes the image of print from one eye and brings it before the other. When necessary, correcting lenses may be placed in the spectacle frame, and the mirror can also be removed a number of feet away if desired. Schmitz of Dortmund describes a very similar mechanical contrivance, but differing somewhat in the details.—*Med. Rec.*, N.Y., March 17, 1900; *Wchnschr. f. Therap. u. Hyg. d. Auges*, Breslau, March 21, 1900.

DETACHMENT OF THE RETINA.

AMONG the most frequent of the more disastrous types of disease with which the ophthalmic surgeon has to deal, must be reckoned detachment of the retina, and it may be conceded that any one who succeeds in devising a mode of treatment of this distressing disease, which is even occasionally successful, will confer an immense boon upon his fellow-creatures. It is several years now since Deutschmann of Hamburg introduced his method of operating for the relief of this condition,—a method which he has now slightly modified in certain of its details. He now makes what is tantamount to a transfixion of the eye, as far back towards the conjunctival fold as possible, the knife, which is double-edged, entering at one side and emerging at a corresponding spot at the other. At the counter-puncture the knife penetrates all the coats with the exception of the conjunctiva, and as the knife is withdrawn its point is made to sweep somewhat out into the vitreous; but his former method of "slashing about" in the vitreous humour, with the view of dividing hypothetical cicatricial bands, he has now abandoned. By his new method he provides, as he believes, two openings for the exit of subretinal fluid. The second part of the operation, namely, the injection of rabbits' vitreous into the space in front of the retina, is effected by means of an instrument combining knife and cannula. Under antiseptic precautions he mixes the vitreous of a young rabbit with salt solution in certain proportions, and injects a certain portion into the vitreous chamber after incision in the manner indicated. Out of 101 cases treated by operation, Deutschmann claims a cure in twenty-six, and decided benefit in thirty-four more, in addition to seven in which there was improvement at first, though this, unfortunately, did not continue. His best results were obtained, as might readily be supposed, in young patients, and in cases presenting a history of traumatism, in which class of cases, it must be remembered, spontaneous cure, though rare, is not by any means unknown. On the whole, it seems as if his method of repeated tapping, even uncombined with injection into the vitreous chamber, was worthy of further attempt, and may prove useful in a certain proportion of cases of this distressing condition.—*Beitr. z. Augenh.*, Hamburg u. Leipzig, 1899, Bd. xl.

ADHERENT CONJUNCTIVAL FLAP.

THE great difficulty with which the ophthalmic surgeon has to contend in the performance of the operation for cataract, is that a considerable proportion of a non-vascular substance, namely, the cornea, has of necessity to be cut off from its "base of supply," while it is contained in a cavity which is probably never ideally aseptic, and is therefore in a condition and situation very favourable for the development of sepsis. Pansier of Avignon proposes to avoid this difficulty in the following ingenious manner, which, like most modern inventions, turns out on investigation to be really a revival of an old method. It is usual, or at least not unusual, to continue under the conjunctiva for a short way before withdrawing the knife with which the corneal incision for the removal of the lens has been made; but Pansier carries the procedure further, and, after carrying the knife for about 6 or 7 mm. under the conjunctiva upwards, withdraws it *without* dividing the bridge of conjunctiva thus left. This bridge has thus one pillar resting upon uncut conjunctiva, and the other formed by the summit of the cornea, which is thus in a position vastly more favourable for the carrying on of the nutritive processes. There are at least two disadvantages in this proceeding, which are that the work of extraction of the lens is made more difficult from the existence of this bridge, and the consequent necessity which arises for the lens to make its escape "round a corner," and that troublesome hæmorrhage is, and must be, distinctly more liable to take place. The method may be of value in cases in which there is extra risk of sepsis from the pathological condition of the tear passage, or of necrosis of the corneal flap from general malnutrition, but with an eye under normal conditions and a patient in fair health the modification seems unnecessary. At the November 1899 meeting of the French Ophthalmological Society, M. Vacher spoke strongly in favour of this procedure.—*Ann. d'ocul.*, October 1899.

ULCUS RODENS CORNEÆ.

THIS is a peculiar variety of ulceration of the cornea which has too generally been confused with ulcus serpens (more usually known in this country as hypopyon keratitis), from which, however, it differs in several important features. The rodent ulcer begins at or near the corneal margin with a delicate greyish white infiltration, which soon breaks down into an ulcer. This area of loss of tissue increases in an intermittent fashion, each advance being accompanied by severe ciliary pain; there is no infiltrated area round the ulcer, no pus in the anterior chamber (as a rule), and plastic iritis is not a constant or even a frequent accompaniment. The edges of the ulcer are always undermined as they advance, and it eats its way persistently, if slowly, round the margin of the cornea. It never, however, eats deeply, and therefore perforation is rare, showing that it has little in common with the ordinary "marginal ulcer"; an interesting feature is, that wherever it is not advancing it has already healed, so rapid is the reparative process. In the majority of the cases observed the patients have been poorly nourished, though not by any means all old, and sac troubles have evidently no such relation to this lesion as they have to hypopyon ulcer. It has a long course, from eight to ten months not being excessive. The pathology appears to be a progressive necrosis, probably of nervous origin, of the superficial layers of the cornea, with or without a deposition of cocci below the undermined margin. It is its superficial situation among the sensory end-organs which causes the ulcerative process to be so painful. In the way of treatment the chief point must be to get at the invading margin under the epithelium; anything short of this is foredoomed to failure, but this granted it matters less what actual antiseptic we use. Fuchs speaks highly of the cautery, but others have not had the same success with it. In some of the cases it is advisable rather to employ mild measures and avoid too vigorous treatment.—Hillemanns (Duisburg) in *Arch. f. Augenh.*, Wiesbaden, 1899, Bd. xl.

GANGRENE OF THE LID FROM TOO FREE APPLICATION OF ICE.

A CASE which ought to serve as a warning against the indiscriminate use of ice compresses to the eyelids is reported by Plaut of Rostock. A woman of 43 received a slight injury to one eye from some dust blowing into it. The doctor called in advised the application of ice, which was accomplished by filling a pig's bladder with small pieces of ice and laying it on. Unfortunately this was left on for twenty-four hours uninterruptedly, the ice in it being renewed from time to time. The result of this was, that practically the whole of the exterior portions of both upper and lower lids sloughed away in gangrenous masses, with terrible deformity from ectropion, as the gap thus left healed again.—*Klin. Monatsbl. f. Augenh.*, Jan. 1900.

TUBERCULOSIS OF THE RETINA.

TUBERCULOSIS of the iris, choroid, conjunctiva, or other individual parts of the eye, is not so very rare, but tuberculosis of the retina is almost unheard of. Story and O'Sullivan record an interesting case. It was that of a healthy, well-nourished-looking girl of 21, who stated that three months previously she had very suddenly, indeed in one night, lost the sight of the right eye; in one part of the field she was able to count fingers. The ophthalmoscopic appearances were those of an immensely swollen disc of a brilliant white colour, the vessels were tortuous and dilated; there were also a few white spots near the macula. The eye was removed, and on section showed a tumour surrounding the entrance of the optic nerve, ⅓ in. in diameter and ⅙ in. in thickness. For some distance round the disc the retina was detached; and between it and the choroid lay a firm homogeneous coagulum. Microscopically, the growth was unmistakably tubercular in its characteristics.—*Trans. Roy. Acad. Med. Ireland*, Dublin, 1899, vol. xvii.

UNUSUAL SYMPTOM IN OPTIC ATROPHY.

NOISZEWSKI records a singular symptom occurring in the course of optic atrophy. His patient, an intelligent married woman, stated that though unable to tell light from dark, she could perceive blue objects; she asserted that while incapable of knowing day from night she could find violets and forget-me-nots in the fields. Patients who are really quite blind are often self-deceived as to their powers, but in this case the author satisfied himself that she could indeed perceive blue objects, and he even succeeded in making a chart of her field for blue. He suggests that the perception of different colours may be the function of different layers of the retina, and that in this case the atrophic process may have destroyed the outer red-perceiving layers, but left intact the inner blue-perceiving layers,—a very improbable condition of affairs.—*St. Petersb. med. Wchnschr.*, 1899, tome lii.

A FATAL CASE OF GONORRHŒAL OPHTHALMIA.

IT is a very rare occurrence indeed for gonorrhœa to cause any alarming symptoms, but in this case the patient actually died of the disease, or at least of its complications. The patient was a negro, æt. 18; he had been wearing an artificial eye for some time in place of his own eye, which had been enucleated,—the author does not say on what account, or when, which somewhat weakens the value of his observation. At all events he had gonorrhœal urethritis, and managed to infect his empty orbit, producing a purulent conjunctivitis; within a fortnight he developed an acute endocarditis, probably from septic absorption, and died of this complication within another week.—*Ophth. Rec.*, Chicago, Feb. 1900.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society.—*May* 2, 1900.—Mr. A. G. **Miller**, President, in the chair.—Mr. **Cotterill** showed patient after laminectomy for paralysis of two years' standing, the result of spinal caries.—Mr. **Shaw M'Laren** showed—(1) A specimen of carcinoma of the œsophagus and stomach after gastrostomy; (2) a specimen of bilateral fracture of the scaphoid bone of the carpus.—Dr. W. G. **Aitchison Robertson** read a paper on "The Activity of the Saliva in Diseased Conditions of the Body." He said that the saliva played a more important part in the act of digestion than was commonly supposed. The total amount of ptyalin secreted in twenty-four hours was 120 grs., while the total amount of pancreatin was only 40 grs. There is no free acid in the stomach for fully three-quarters of an hour after a meal is taken, and salivary digestion goes on in the stomach during this time, with the result that nearly all the starch is converted into sugar. In renal disease the activity of the saliva is lowered, while in pulmonary disease and in diabetes it is very active. The secretion varies also in amount. It is greater in acid dyspepsia, and lessened in chronic Bright's disease, in ulceration of the stomach, and in fevers generally.—Dr. **Claude** B. **Ker** read a paper on "Cross Infection," so called, which appears in this issue of the Journal.

Edinburgh Obstetrical Society.—*9th May* 1900.—Dr. **Milne Murray**, President, in the chair. **Specimens.**—Professor **Simpson** showed—(1) An anencephalic fœtus, (2) a bipartite placenta.—Dr. **Lamond Lackie** showed the bladder and kidneys from a case of suppression of urine.—Dr. **Matheson Cullen** showed—(*a*) A slough of the cervix; (*b*) radiographs of polydactyly.—Dr. **Foulis** showed a new handle for the axis traction forceps.—**Communications.**—An adjourned discussion on Dr. **Haultain's** paper on "Pathological Amenorrhœa from other than Constitutional Causes" took place.—Professor **Simpson** read a paper on "Intra-uterine Vaporisation." He referred to the interest taken abroad in the therapeutic effect of steam, and described his own experience in the fourteen cases in which he had tried it. They were all cases in which uterine hæmorrhage had been a marked symptom, and in nearly all benefit had resulted. Professor Simpson showed the instrument and demonstrated its use.—Dr. J. W. **Ballantyne** read a clinical note on a case of vulvar hæmatoma in labour. When Dr. Ballantyne was called, the vulvar swelling had appeared, and was visibly increasing in size, until it rapidly became very large. He hastened the labour, and endeavoured to deliver by forceps without rupturing the hæmatoma. It, however, burst, and the contents were evacuated. The cavity was packed and drained, and the patient made an uninterrupted recovery.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*May* 4, 1900.—In the absence of Sir W. Gairdner, Dr. NESS showed a case of probable Addison's disease, associated with tuberculosis and leucodermia, in a woman, æt. 22. On admission there was weak action of the heart. Examination of the blood showed 58 per cent. of hæmoglobin. On the face there was general bronzing, with white leucodermatous patches at the sides of the mouth and at the right side of the forehead. There were also white hairs on the right side of the head. Similar changes were present on the arms, legs, neck, and thorax, and very markedly on the back. There was no pigmentation of the mucous membrane of the mouth. Tuberculous disease was present at the left apex. Cod-liver oil, malt, and suprarenal capsule were given, and in spite of the advance of the tuberculous lesion in the lung, the patient has made some improvement.—Dr. W. K. HUNTER showed—(*a*) A case of Friedreich's disease in a boy, æt. 15. The intelligence is good. Progressive deafness has been present for the last five years. As regards facial expression, the mouth is kept open and there is constant twitching of the lips. The palate is highly arched. Speech is lisping. There is no nystagmus, or paralysis of the external or internal muscles of the eyeball. There is a marked antero-posterior dorsal curvature, with a compensatory lumbar curvature. Lateral curvature is also present. There is incoordination of the arms and legs, but no definite muscular paralysis. Atrophy of the left leg is very marked. When the patient attempts to walk, which he can only do with assistance, the gait is cross-legged, and the feet are thrown down in a stamping manner. There is marked genu valgum and pes cavus. There are no knee-jerks. (*b*) Case of pseudo-hypertrophic muscular paralysis.

MEDICAL NEWS.

THE NEW PROFESSOR OF MEDICINE.

THE Chair of Medicine, vacant through the death of Sir T. Grainger Stewart, has been filled by the appointment of Dr. JOHN WYLLIE, and the election has been hailed with wide-spread satisfaction. The new Professor, who is now fifty-six years old, graduated in 1865, and after obtaining his degree occupied both medical and surgical posts as Resident in the Royal Infirmary. Having studied in Paris for some months, he became Resident Medical Officer to the General Hospital, Birmingham, which post he resigned in 1868 to settle in Edinburgh. Here, as is well known, he has filled a long series of important offices in the New Town Dispensary, Royal Infirmary, Medical School, and Royal College of Physicians with great acceptance. He has also acted as Examiner on Clinical Medicine in the University of Edinburgh, and has received from it the honorary degree of Doctor of Laws. His appointment as Professor of Medicine is therefore but the culmination of a long and useful career in the service of the Edinburgh School. On congratulating him on gaining the eminent position he has won, we would most cordially wish him success and happiness in his new sphere.

ANALYTICAL REPORTS.

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Hyrgolum.

(Burgoyne, Burbidges, & Co., London.)

This firm has brought under our notice a recent modification of metallic mercury, whereby the metal is rendered fairly soluble in cold water, by a patented process, at the hands of the chemical works of von Heyden, near Dresden. Not long ago we had occasion to describe the metallic bodies associated with the name of Professor Credé, more especially the silver preparations. Hyrgolum is a similar transformation of the ordinary fluid metal mercury, into an allotropic, colloidal form, and resembles the soluble silver products by reason of its non-caustic, non-toxic action, and its rapidity of absorption.

Mercury in its colloid form is the outcome of the addition of a concentrated solution of ammonium citrate to a mixture of dilute solutions of mercuric nitrate and nitrate of tin; a mixture which results in the formation of colloid mercury remaining in solution, the ammonium salt precipitating the metal as a fine black powder, which can be filtered off and dried. To appearance it forms a fine black powder, affording a dark brown opaque fluid on solution in water. Owing to the method by which it is obtained, it always contains a trace of metallic tin, as Lottermoser, its discoverer, admitted. The tin cannot be entirely removed without rendering the colloid state of the mercury unstable. The preparations of colloid mercury manufactured comprise:—Unguentum hydrargyri colloidalis, emplastrum, pilula, pulvis, and tablets. The ointment contains 10 per cent. of the mercury, the plaster 15 per cent., while 4½ grs. are divided among each thirty pills, or rather pilules. The evidence to hand points to the ointment as the most valuable means of using the substance (by inunction), and the results recorded of its effects suggest that in it we have a most powerful remedial agent, the action of which takes place quickly, while the toxic effects are much less pronounced, and the benefits conferred more tangible than those following the use of the common forms of the metal and its salts as at present exhibited.

Ialine Disinfecting Fluid.

(Burt, Boulton, & Hayward, London.)

Ialine is a concentrated disinfecting fluid, of a dark brown colour, and with a strong phenol smell, which in the proportion of 1 part to 40 of water (preferably soft water) is adapted for the disinfecting of drains, etc., of 1 to 80 for washing animals, purifying walls and floors of infected rooms and wards, and in greater dilution for addition to baths, for washing the hair, or for surgical purposes. It possesses strong antiseptic powers, is not unpleasant to use, and has the additional merit of being cheap. As the solution is concentrated and necessitates the addition of only small amounts to form a somewhat large quantity of antiseptic fluid, it offers a convenient means of providing in small bulk an active agent for general employment.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING APRIL 28, 1900; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°.	Below 42°.					
Mean	43°·5	[1] 116° [2] 249°	88° 619°	1·8	9·3	125	334	2°·7
Observed	44°·5	[1] 151° [2] 202°	66° 674°	1·7	10·5	134	330	3°·25
Difference	+1°·0	[1] +35° [2] −47°	− 22° + 55°	−0·1	+1·2	+9	−4	+0°·55

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING APRIL, AND SINCE JANUARY 1, 1900. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 1149 [2] 4856	198·7 210	225 899	39·0 38·9	122 464	21·1 20·2	237 1090	41·1 47·0	129 538	22·4 23·2
Actual Deaths and Rate per 10,000	[1] 1135 [2] 5190	196·3 224	273 947	47·2 40·9	108 504	18·7 21·9	202 1193	34·9 51·4	130 559	22·5 24·1
Difference from Mean	[1] − 14 [2] + 334	−2·4 +14·0	+48 +48	+8·2 +2·0	−14 +40	−2·4 +1·7	− 35 +108	−6·2 +4·4	+1 +21	+0·1 +0·9

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1898	[1] 63 [2] 276	10·9 11·9	31 119	5·36 5·14	94 391	16·4 17·0	115 464	20·0 20·2	44 195	7·66 8·3
Actual Deaths and Rate per 10,000	[1] 69 [2] 324	11·9 13·9	31 139	5·36 5·94	101 499	17·4 22·0	142 464	24·5 20·2	55 216	9·5 9·2
Difference from Mean	[1] +6 [2] +48	+1·0 +2·0	± 0 +20	± 0 +0·8	+7 +108	+1·0 +4·6	+27 ± 0	+4·5 ± 0	+11 +21	+1·84 +0·9

* NOTE.—The figures [1] denotes the data for April, [2] for year to date.

The four weeks ending 28th April show a mean temperature one degree above the average, an increase in day-degrees over 42° F. equal to 14 per cent., in those below 42° a decrease equal to 25 per cent., of the normals expected. The rainfall was slightly deficient, the hours of bright sunshine in greater number, and the mean variability of temperature very large, the third week of the period giving as high a figure as 5·°5.

The first four months of the year have been characterised by a considerable decrease in warmth, and a somewhat less marked excess of cold, while the rainfall has been above the mean, the duration of sunshine slightly below it.

The total number of deaths recorded during April fell slightly below the normal, those from circulatory and respiratory causes chiefly contributing to this result. Deaths, however, from constitutional diseases, from pneumonia, phthisis, and cancer, exceed the average. Influenza caused 26 deaths in the four towns.

For the first four months of the year the death-rate shows a marked increase, contributed to under every class of disease except phthisis, deaths from which correspond exactly to the mean. Pneumonia is credited with an increase of 27·6 per cent. over the average. Influenza has caused 293 deaths directly during these months.

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